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Number 617

human and social problems raised by the

Post Office Engineering Union, on the opening day of the TUC conference in Brighton, when he moved an eight-point

motion relating to employment problems.

The motion was curried manufacousts

responsible halance," said Stanley. "On

This was one of the points cancel by

introduction of microelectronics.

created by technology.

IT is imperative that trade unions strike at the one band we don't want to be latter-

responsible balance and do not become day Laddites, blindly apposing all

"As trade unions we have to strike a - of the honour and social implications.

Thursday, September 7, 1978

the maintenance of existing equipment

"Only the trade unlons can insist upon

Tumon values coming first, and that the

recoffices reclinology must take account.

the commec-productive."

annation, he said,

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isa mission io Mexico

HIGH-POWERED delegation al Marketing Sub-Committee the Computing Services . Ay later this month on the hiantion of the Mexican Govern-

The CSA mission, which will and the TUC was asked to develop deiso include representatives tailed proposals on the subject to time for om the Department of In-istry, the Central Computer next year's congress. gency, the National Comake presentations over three ays to some 150 representatives Mexican government departsents and public sector bodies.

"This is the first breakthrough is the CSA International Marsting Sub-Committee," imputer Weekly. "We will be inphasising the whole range of alls and experience of the UK avices industry."

orranti sale

THE stake that the NEB holds in mani 6 being cut from 625% be sale of shares for not " . aillico This gives as at million profit on the overnment's investment in grantl, one of the UK's most tecessful high technology noment introduction to the sock Exchange easier. The hares are being sold under simtified conditions of the deal hich gave Ferrantl governcent aid in 1975 (CW, Mny 22,

Orbit launch

ORBIT, the IBM mini-based distributed processing niternative to its 3780 communion tions processor (CW, August) 11), is expected to be nonounced by IOM next wenk, occording to US apetroes.

Hore memory

3 MAIN memory that can be spanded to one Megabyte and 2000 nanosecond cycle time to two of the main features of he Eclipse 3/250 scientific bating point processor, an inurst multiplexer channel lering 1/O rates of up to 10 tems Network Architecture. legabytes per second.

OM move

HE computer output microfilm rvice side of the Loundes Ajax breau has been moved from ictoria in Central London to HUMAN CHESS WIN le company's new head-parters at Milton House, Croy-mester Devid Levy wen his £1,280 or. Surrey. At the same time cOM service has installed a cond Datagraphix 4565 COM

Yimpey's minis

TOTAL of 16 Data General inicomputers with a Iransac- PROFESSIONAL PRIDE inicomputers with a transacon processing software packit is sometimes coaler to peac
of developed in the US by the
it is sometimes coaler to peac
of cameling through the open of medical than to define what is really meant by a "computer professional." But BCS president Professor peut Samet oxplains why he begin that it is sometimes coaler to peac
of cameling through the open of the same of the peace of the same of the eorge Wimpey and Co, under a elusive computer pro

IBM Computer Users' Associa- and VI'AM with CICS, which face to other major systems anicomputer introduced by the has complained to the company about the marketing of the with the \$7250 Incinde a beginn point and a dynamical lons are sometimes of the users feel is an attempt to force them into adopting SNA.

However, "uone of the users feel is an attempt to force them into adopting SNA.

However, "uone of the users feel is an attempt to force them into adopting SNA.

In the US, IBM is reported to contacted reported extreme disputations and the state of the users feel is an attempt to force them into adopting SNA.

However, "uone of the users feel is an attempt to force them into adopting SNA.

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However, "uone of the users feel is an attempt to force them into adopting SNA.

However, "uone of the users feel is an attempt to force them into adopting SNA.

However, "uone of the users f bating point processor, an inigral array processor and a

Function software, nn important computent of the firm's plans

have made special efforts tubely carry users of VCF/VTAM. In

VTAM access method or with for networking, including Sys- addition to bugs in the initial

WHAT'S IN STORE het thet he would not lose a match
lose computer chess program in the
len years from August 1868. But
Levy did not have it sil his own

mankind serve technology."
In his opening address, the TUC chairman David Basnett also pinpointed "latter-day Luddites" in dealing with the changes to technology and insisting on the impact of microelectronics as one of and stills bowever inefficient, however The main concerns of the totons, ite said tarchyant they be once. That approach the combination of new technology and a proceed smoothly." Bryan Stanley, general secretary of the would not only be impractical, it would world recession could hold out the prospect of jobs being killed faster than they The path to success, felt Stanley, did not lie with the scientists, the economists technology could hring "apportunities as or the managers; these groups were too well as difficulties." bound up with the technical details of the

The resolution called on the government to develop forward plans to expand Speaking in Australia, before the TUC job apportunities in affected areas and to

Technology must serve mankind, not resolution said, to support the oriented society.

BOTH IBM (a) ICU have made important moves in the burgeoning automated office market. As a first (c) 1, towards a full-scale affack on word-processing, ICU is negotiating a large order

will a board for daisy wheel printers while BM has introduced a Text Routing System

developed in the UP. for the Series I which enhances the company's electronic mail and word

the word processing market, and

has not decided which of the two

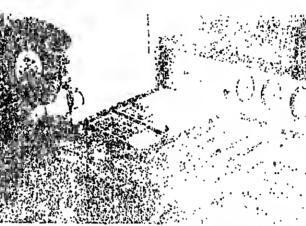
As exclusively reported (CW, March 23), word processing software has been developed by

don't want to be latter-day Luddites' -TUC inniementation of "urgent steps" to develop Britain's microelectronics enpablity and it also said there should be a growth in training and education "to allow the transfer to a high technology society to

> A public commitment by government ton shorter working week and a study of the opportunities offered by increased leisure was colled for, International cooperation with other unlons and governments was also emplinsised.

discussions began (see page 9) Lord develop a comprehensive study of the Avebury criticised trade unions for social consequences of the technology.

Specialist training was needed, the



processing capability. Introductions at Famborough International 78 Include a nuw microprocessor-controlled voice-switching system from internation Acradia, shown here.

oagor for computer power, say conference delegates

forence on Strategles and Policies for laformatics is returning from the ltt-day conference in Torremolinus impressed with the importance attacked to computing by developing com-

tries.
"We have found a great

THE British delegation to the of corporate communications at Spin Inter-Governmental Con- ICL and a member of the fields the UK offer of training assist-

countries believe that a prag-mutic approach is best, while the nathmal plans."

He cited the UK offer of bureaux for online program that informatics must be a key training assistance as an Jesting had left some Brazilian element in their development example of the pragmatic industries totally dependent on

products will get the major thrust. The software is already under test at some enstomer siles. "As far as we can ascertain, The signs are that the 7502 series will be emphasised, at gation, fold Computer Weekly. - ance is the ordy Initiative frum least in the UR. There is a wide

"However, the developed any country which has been range of models and configuraformally presented to deletions of the terminal system, which is configured around a developing countries seem to favour grand strategies and cegarded with suspicion, notably have a loosed for it within ICL. But it is hy a Brazilian delegate who understood that the word proclaimed that use of off-shore

ICL for both the 7502 screes of terminal systems and for the 1500 terminal inherited from cessing on the 1500 is being The company has not yet completed its plans for entering raggidered as a major market

area in the US. The fext conting system from IBM interfaces a Series I mini with the Office Bystem 6 to provide a strong electronic mad and shared logic word processing

capability. This facility is on important element in the "nutnmated office" which is currently being altacked by a annulier of large multinationals, including Xerox, AT&T, Wang and Toshiba (CW

Auenst 24). ● Turn to page 8

strategles," Peter Hall, director approach (CW, August 3i). Software bundling complaint by

for networking, including Syslems Network Architecture.

One aspect of the CUA's objection is the handling of ACF

addition to bugs in the initial complementary software products such as ACF/NCP", according to the US publication were encountered in the inter-

A STATE OF THE PROPERTY OF THE

Although the apotlight is usually turned, on the meinframe processsor, the storege media ero on equally important part of an instal-lation. In this week's mognetis Levy did not have it sil his own way. Camputer Wockly corries o match report end a Chessleb by one of the losers of the bet, Professor Donold Michio Pegas 3 and 11

PROFESSIONAL PRIDE

It is sometimes coaler to peece terms of the new field of ovenic memories.

Pages 17 and 19

Pages 17 and 19 IBM reorganies

SALES BITE

Our populer Seles Bit column takes an included dig at the "routine call" gamble.

Page 52

NICO

PAGES 22-55

ALSO

Computerview on multi-media power game Focus on DPMs



A Principle of the Section 1979



<u>Yol. 25 No. 617</u> Thursdey, September 7, 1978

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The UK. The interesticant edition, which is published IS times a year, has a circulation of over 84,000.

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The multi-media power game whose precise information

of news end infermatien media have been set in metien by what the publishing werld likes to call deta, micre-based heme entertainment centres, cemputerbased publishing techniques et ol are changing the nature of the medis which have become intrinale to the daily lives and educational aystem of most

Fer those whe believe that nformstien is pewer, this ceuid leed te the emphasising of Impertant divisiens in society.

Writing in the letset issue ef InterModia, telsvision preducer Antheny Smith cenciudss e comprehensive look at hew computers are changing the fecs of the publishing world by seying, "Tite new tschnology, and the new perceptiens which surround it, are preparing mess eoclsty for impertant, and per-hnps undesirable, internal partitiona, which may place great strains upon the saif-image ef

democratic socisties. This view is based en his snslyeis that the efficiency ef and swareness throughout

needs can be accuretely pinpointed, whether in the ferm ef newspapers with a wide range of highly specialised supplemants er through viewdata systems where the user defines his ewn sccess path.

"The newspaper and atten-dant information medie are new being locked inte patterns ef advertising and distribution which make large quentities of information evaluable to small elites," Smith writes. "The infermation is much mere substantisi and perhaps 'better' than ever before. But those sectiens of the audience which do pletely cut off."

in the past, Smith suggests, an impertant aspect of the dsmocratic process was that the newspeper was a "compiste secisi prescence" including in-formalien that the reader might not have pre-salected but which helped to broaden knowledge

percaptive speech te yeung

He elso warned that variatiens in the ease of access to cemputer-based information could lead to grave secial divisiens, suggesting that the middle classes will be the quickeat to see tha merits of participating in the informstlen revolution. To help overceme this, he advecated the widsapread previaion ef viewdate terminala in public places to help educate s wida range of peeple in the uss of the new infermatien medie.

All this is, ef ceuree, just one epsect of the ways in which information technology is heving not demand to be informed (and a widespread impact on society who in prectice perheps never end is e further pressing were) are now much more comsien and ection on the technology must spread beyond the current concentration en just "the micro revolution and its impact on employment". However important thet topic mey be, it is just one component in the informetion power game.

*InterMedia is published bi-monthly by the International Institute of Communications, Taviatock House Smith's view was supported East, Tayleteck Square, Lendon netien can be distributed more lost week by Lerd Avebury WCI SLG. Telephone 01-388 0871.

This is very much the case at level the complexities and anags

company status. Fer teo long DP on to the empire of the company puter systems.

Secondant or nalled to the Whether DP management will company sacretary's maat ef continue to accept their com-

Few DP sactions have remains te be seen. For a cen-achisved an independent break-siderable time, DPMs were cenaway and even these which tent te settle fer the title with heve, soon found themselves or without corporate power. embraced by e newly-emergent menagement services ragime.

Company politics or status chasing teok secend pisce to the DP management have been need te cope with expanding DP status recognition. A losing eut in the status respen- workleads. Any spare tims was sibility stakas and could well deveted to DP career developnow ba at the cresaroads. If ment within the department. both parties usuelly cettle for computer technelegy doesn't Psy scales in company terms the quiet life. get them first, than corporate

Crossing to the US certainly will net remove the Ihreats. The DPM there is under even greater asseult. Although It aeems the mini distributing massage has

yot te affect the marketplace, keen compeny asscutives are represented by the pertmants a raplacement computing system had been ordered. Having made the chelce, the two peeple most involved with the system senants were discussing. AT ene of our university depertments a raplacement computing system had been ordered. Having made the chelce, the two peeple most involved with the apparete room for the new system is consulted last a further **Oceanic Rentals** Short term rental and leasing

of industry standard terminals. Printers - KSR, ASR, 30cps, 120cps Portable printers - bullt in acoustic coupler VDU's - Newbury from stock Acoustic couplers

Paper tape reader punches Hewlett Packard desk top computers 15 Bevis Marks, London EC3A7LH, Telephone 01-283 3667 tem," they pointed out, "the

IT is a frustrating life for the DPM. No sooner does he believe that company rewards and that company rewards and ebout to come his way, then computer technology intervenes. at the crossroads

present. Cempsnies, far frem challenging the DPM's rele. promoting and recegnising thair DP tesms, are new busy distributing responsibilities acress the DP barriers. As a result, user information systems. These inmensgement, once the bane of clude computer systems, elec- within the industry. But being the DPM, are finding out at clese tronic mail, word processing and business form design.

ef cemputing.

It took DP management a Such thrests, fertunately, de not fsce DP menagers in the UK. considerable time te achieve For s start, few company even their present vulnerable executives, however thrusting, weuld wish to grapple with ferm departments have been tacked design let alone running com-

pany role in a passive manner

Being DP manager was s sign information systems. These in- of considerable status, at least DP maneger of a flourishing msinframe configuration is in rether o different league from being responsible for a small mini-based system. Power and prestige ere distributed along with the system. The alogan "Chips with everything" will, in such circumstances, be particu-

larly relevant to the DPM. Meanwhile, Weekly chides the IK DP professionei with being too conservotive and shert-sighted. This may well be the cese but in many instances it is the company which limits progress, holds back development end impedes dynemic DPM is often the lest

MUERRUM

system aspects were discussing with the head of department a new design end decor for the machine room, including e small partitlened room in which to housa the computer. All the ueuel arguments for auch an

chvironment were put forward; lees noise, controlled temperature and humidity, pleasant.

We must ensure the best be done,

To shield tham from the ayeworking conditions and so on.
Finally, a clinching argument
wes put ferward by that musical

tem is eesentlal lest e further tyranny of key is mechanically enforced. For it might be a key, ellen to one of us?" they added. The moral:

For those who like to work and

© From John Davidson of Graphic Display Bystems, of Cambridge who wins this week's \$5 interrupt

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And after e day et the Palace

will be competing in the biggest ethletic contest of its kind.

Tickets cost 50p for edults end cost will be £2.50 including food and music will be provided by the Surrey Sound greup.

Ten years ago... COMPUTER WEEKLY SEPTEMBER 5, 1968

THE GPO's Netional Date Proceesing Centre, at Leeds, hed erdered the first nen-dedicated computer, on ICL 6 ystem 4/70, worth £800,000 . . . The first Linetren 505 instelletien went inte eperation at the Hilees, Hempshire, efficae of the rtsmouth Evening News . . .

lect was in the finel stages of implementation . . Experi-ments carried out at RCA's DP research laboratories at Prince-ten, New Jersey, with a new semicenductor leaer device had shown that infra red laser light eignale could lieve a potential appeal of trillion he of a second, A messive schame using com-puter techniques to control the end pave the way for their com-entire building operation for the

GOVERNMENT COMPUTING

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SONIC SONNET

t remember well young Debbie Her leens, her epots, her half. The laughing in the corner That temporery junior etr. But mostly when I think of her Bui moally when I inink of It is with ganuina grailfude For she aupplied divarsion Albeil somewhat crude. Har tiltars and har storia About her biking lad Would leke our minds eff Office noise, which made us all leal bad. You see we've been sutomated The machine is here to stay About here was both we don't need Debbis. That she must go ewey. So if you den't heve a Debbie And the machines are moving it Give us a ring at Delpa And we will oure the din.

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KELVEDON CENTRE TO BE CONVERTED

Course for the disabled in doubt

A QUESTION mark hangs over complete the future of computer cenrses for the disabled in the UK, foilowing a decisien by the Spastics Society to convert Oakweod Kelvedon, Essex, inte a purely residential establishment.

Kcivedon is specially equipped to cater for the severely disabled and since early last year has been the location of two pilnt residential pregramming courses fer disabled people funded by the government's Training Services Agency as part of its TOPS training A spokesman for the TSA said

that it has planned to hold three pilot courses at Kelyedon and then decide whether to make them permanent. The TSA says that it is now

considering the pessibility of using computer manufacturers or sultable computer users to or sultable computer users to train disabled people, provided

The BCS specialist group for the disabled first conceived the they are prepared to employ the person whan the training is receiving many letters from dis-

chess master Dovid Levy won

his 10-year bet that no chess

playing computer would bear him in the decade up to the end of August, 1978. His victory

was achieved at the Canadian

National Exhibition in

Toronto, where he played a

six-game match against the

The first geme took six

hours and ended in a draw

after 64 moves. Levy won the

second game in three hours

and 54 moves and it shewed that Chess 4.7 was not good

enough sgainst the Sicilian

Defence. in the third game,

when Chess 4.7 resigned after

42 moves and three and a half

hours, another serious loophole became obvious. For

the fourth game Levy decided

to take the computer on at its

own game and here Chess 4.7

showed its strength and Levy resigned after 57 moves and

three hours. For the fifth game

Levy reverted to his own slyle and won the gams in 42 moves.

This game toek about slx

hours because of transmission

problems but it gave Levy the match end the bet.

Levy played on an electronic board which enabled his moves

to he read by the CDC Cyber 176 at Control Data's Centre et

Arden Hills, Minneapolie, on

which Chesa 4.7 had been

loaded. The computer's moves

were indicated on the board by

red lights and assistants moved

plon Grandmaater Weiter

Brownc, raalgned when

playing ageinst a slightly

upgraded version of Chesa 4.6.

the world computer chess champlen, on the 176. The

program. wea one of the opponents in a 44-board simultancous display (CW, June 22). All versions of the Chase program have the

Chass progrem heve been written by Devid Slete end

Scottish and Irish agent appointed

A MARKETING agreement has been signed batwaen J. T. Sin-clair Ltd of East Kilbride and throughout Scotland and ire which Sinclair's will market oil industry will be emphasized in Sinclair's sales afforts.

Earlier this year US cham-

the pieces into pesition.

Chess 4.7 program.

Levy beats Chess 4.7—and wins 10-year bet

LAST weekend internotional Larry Atkin of Northwestern

The TSA is uncertain about interesting employment than suitable eitemative arrangesuitable sitemative arrangements for the TOPS ceurses, but

Derek Nichelson, chairman of Further Education Centre at the British Computer Society's specialist group for the disabled, told Computer Weekly that he was centacting the Queen Elizabeth residential training college for the disabled at Leatherhead, Surrey, to ascerlain if the establishment was prepared to take over from

As part ef a residential deveiopment fer 42 disabled people at vilten Keynes new tewn, the Spastics Society is setting up what is described as "an intellectuel workshop" with equipment thet will include computer terminala. The workshep will be for the TOPS pregramme used by 12 residents of above courses because the training

Levy's bet had originally

been struck in Edinburgh in

August, 1968, at a machine intelligence workshop. John

McCarthy, o world authority on artifical intelligence, and Donald Michic, Professor of

Machine Intelligence at Edin-

burgh, jointly took up Levy's

£500 challenge that he would

not be beaten by o computer progrom in the subsequent 10

yeara. A yeer leter Scymour Papert, Ai Professor nt

Messachussetts institute of

Technology, edded a further £250, and in 1971, Professor

Edwerd Kozdrowicki, of

California University, put up

\$1,000. Levy toek £250 of this

end the remeining \$350 was covered by Professor Ben

Mittman of Northwestern

Bafore going to Toronto, Lovy had feced another clisi-

lenge when he played against

MscHack, e progrem written by Richard Greenblatt at MiT.

This was mounted on e fester

machine then had ever been

used for it before, e Digital

Equipment KLI0 processer on

a DECayatem-10 belonging to

In addition, Cheopa, a

special purpose chass mechine

was linked into the system.

Bulit at MiT by John Moussouris es part of hia PhD

thesis. Cheops le cepable of

doing forward searches on as many as 10 million positions.

This comperes with the more

MocHack (CW, May 25).

normal 10,000 to 100,000 of

Levy played two gemes

egainat thie powerful com-

binetien, winning the first in 43

moves. The second wea more

closely conteated but resulted

In another Levy success after

more than 60 moves and a tight

Rock and Pewne ending.

• Chessish — page 11.

University.

usually offered (CW, June 2,

Apart from Queen Elizabeth

two other further education colleges, in Kent and Lancashire, but says that neither is suitable average intelligence, but is not intended to be a training centre. they provide is almed at people of average or low intelligence.

residential training cellege. there are three ether colleges still running residential training courses for the disabled that are funded by the TSA, Finchale College at Durham, Portland College ot Mansfield, and St Loye's College at Exeter, but there is some deubt about their ability to cater fur severely dis-sbled peeple in the wey thet Kelvedon could. The Spestics Society itself has

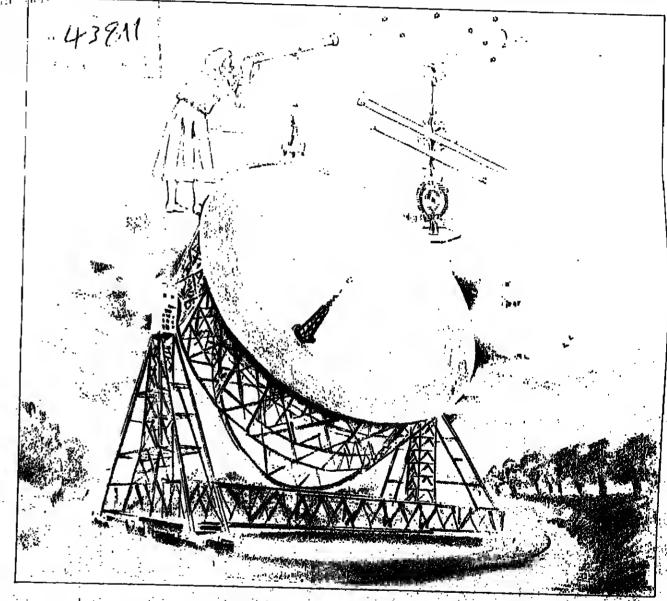
COMPUTER WEEKLY, September 7, 1978

Honeywell to build Level 6 mini in Scotland

PLAN6 to build the Heneywell Level 6 minicomputer in Scotland, exclusively predicted in Computer Weekly (Nevember 24, 1677), have come to fruitien, and 6 cottlen Office Minister of State, Gregor MacKanzle, was there to heer the ennouncement.

A £500,000 preduction line is being not up at Newleuse, Lenarkshire, and the minim with be built etangetide 14 medels in the Level 66 targe-scale meinframe line stready built at Newheuse.

The Scotloh plant, established solely to meet UK demend, begins manufacture next Merch, and to the demend, begins manufacture next Merch, and to the third manufacturing location for Level 6 after 6 enton in the letty Mey, who werkn on the power line.



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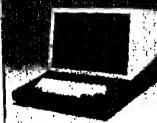


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Right to information: The fight goes on

By Tom Riley

THE publication earlier this year of a White Paper on the raform of Section 2 of the 1911 Official Secreta Act made it clear to those advocating laws on access to information that the government has no intention of bringing in legislation in the foreseeable future (CW, July 10).

The Whita Paper stated that the US and Swedish experiences needed more study before any implementation was made. It went on to say that "before deciding whether to go further, we shall initiate a more detailed study than has so far been pos-sible of overseas experiance and Its ralevonce to our own canstitutional sysiem. In order to see whut further action, whether by meons of legislation or by non-statutory methods, may be desirablo, and we shall announca our conclusiona from

this study in due course." This caused n furious reaction from those who have been fighting for legislation. The general consensus is that the government is stalling yet again in order to keep tightly clamped down the ild of secrecy that preventa Whitehall from being responsible to the public for its actions. The Prime Minister and his senior ministers have chosen to ignore their own grass-roots elements, those members of the Party that passed a resolution last year urging the initiation of a Freedom of Information law.

in addition to this, the Labour Party has proposed an Fol law ond is currently drafting propo-

Robin Cook, Labour MP for Edinburgh Central, introduced a private member's Bill, the Official Information Bill, in protest at the White Paper. The that the costs of the legislation Bill made substantial racom- might be probibitive. He told the mendations, including one meeting that in his years as a which said that a department Civil Servant he had witnessed would only have 20 working the wasting of millions of

days to respond to an informa-

Tha public pressure campaign has been outspoken in its reaction to the White Paper. At an open meeting in the House of Commons after the release of the White Paper, Arthur Lewis, Labour MP for Newnham Northwest, and chairman of the all-party Parliamentory Committee for Freedom of Information and Privocy, told the large crowd that every person presant

should canvas all the candidates

in the next election to make

freedom of Information a major

issue and to get every can-

didate's views known and

recently published book, Your Disobedient Servant, attacked

Leslie Chapman, author of tha

published in the local press.

pounds on questionable projects and activities

He felt that the cost would be minimai importance compared to the long-range benefit to the country. A government that was accountable to its people, and knew that the money it was spending could be overseen by the public eye, would go a long way to distribute the tax dollar a lot more wisely than was currently being

The rapid devalopment of the powerful naw force of informetion technology has high-lighted the growing value of information as a key factor in business, social and personal

Aspacts of the Information question include the free eccass to public information and the proteotion of an inlividuel's private data — tha suas of freedom of information and privacy. Freelanca ournalist TOM RILEY has acently come to the UK from Cenade, where he her been a committed supporter of the freedom of information cam-

vativa MP for Hastings, and

ments. Lewis aald that his cam-

chairman of the Freedom of fn-

come for action.

paigns throughout the world. Here Riley explains why UK dividuals. The TUC and tha TUC-Labour campaigners ara optimistic de-spite recent extbacks. Party Liaison Committee have passed resolutions calling for laws on freedom of information and privacy and have been Kenneth Warren, Conser-

joined by many others. The government can only ignore the will of the people for so long before the electorate tires of it and throws it out at the polis. Proposition 13 in California in which the people voted for

Lords, but support from the

public was so widaspraad that it

necessitated the setting up of a

aecond committee to organise the campaign properly and take

advantaga of the growing sup-

The affects of the work of tha

two bodies have certainly been

felt, as the whole of government

secrecy - the right of the public

to be truly informed of what its

govarnment is doing and why,

and the right of an individual to

know what is on his/her own

najor Issue in the media and

with many other groups and in-

personal file - has become

in the UK and the government does move in a different way, but

could be that freedom of infor here were already ovar 200 mation is an issue which could bring about such a radical star Parliamentarians who supported this concept of access to as defeat at the polls, as more government reports and docuand more people become aware of the Issuc,

The reaponse to the cont-We are now moving rapidly inio an Information Age. Conmittee's work has been excelsultant Adrian Norman. lent, and a lot of progress has pointing this out in a speech at been made since Lewis set up the All-Party Committee In the open meeting in the Houseof April, 1975. The Freedom of In-Commons, said that he was of the opinion that "by the time we formation Campaign aprang out f the All-Party Committee, as have an effective Freedom of the former had been organised Information Act we shall be an o develop support in the House f Commons and the House of formation economy.

It is recognised that information is power, and that he who controls the information controls the state - a precept known to any dictatorship.

Information is a major industry today. Its importance to the economy is reflected in the interest shown by people in the computer field who, aware of the great dangers implicit in the atorage, retrieval, dissemination and other uses of Information take a keen Interest in fraedom of information.

will recommend that individuals have access to their personal medicul, credit-rating and simi-

palgn would continue to apply the ballot box is still there. It fervour and dedication.

information society and an in-

The report of the Data Protection Committee's atudy is, therefore, anxiously owalted, as it will deal with the other side o the coin of Fol, one of equal importunce: the protection of the individual, who today has vast amounts uf data about him or her being stored and circu-

It is expected that the report

Whatever the outcome of any future studies or promises by the government (whether it be Lsb. our nr Conscrutive) it is certain that Fol advocates will continue their campaign with

formation Campaign, the public arm of the All-Pariy Committee, said that enough study had been done on the US and Swedish systems, and that the time had lowared property taxes and caused glant spending cutbacks, Neither body, though disap-pointed by the government's is one such example. Things are definitely different procrastinating actions, is discouraged by racent develop-

'Personal' impact on the DP manager

early next year.

other company.

specific products, which will

then be cross-licensed to the

AMD has decided to go in with

est supplier of tape drives in the

world. He claims that STC now

ships a higher volume of tape drives than IBM — a claim that

its anti-trust duel with the US

STC now aims to achieve the

same dominant position in the

Commented SCL director

George Kerr, "Wa are facing an

Increasing shortage of commar-

cially trained ataff who can

combina practical computing experience with a first-class

JUST how much is the personal computer relevant to the DP mensgar? This quastion is tikely to be saked more end more so the market

To provide e forum et which an enswer may be found, Computer Weekly is collaborating with the institute of Data Processing

Manegament in an evoning meeting next month that will give an airing to the impect and trando of micro systems on data processing

msinframa computer supplier, Dr Adrian Stokes of Langton Systems, and Computer

Weakly aditor Malcolm Peltu, emong others, it is also planned to have a display of perso computers on which interested perties can bble. Date for the forum is October 18, and Taking part in the discussions will be e the vanua is the impartet Hotel, Russell sanframs computer supplier, Dr Adrian Squera, London WC1. Starting time is 6pm.

AMD allies with Zilog to enter 16-bit micro market

vanced Micro Devices. The 28000 will be launched at the end of this year.

The two companies have signed a technical exchange and cross-licensing agreement specifically for the device and its peripheral and support circults. It does not give Zilog rights to AMD's 2900 family 4-bit slice devices.

president Jerry Sanders, the Under the terms of the agree-28000 offera "the highest ment, AMD will become a performance/cost ratio for the second source for the processor, next generation CPU." and will soon be receiving mask sets from Zllog, together with sident Federico Faggin expreas test and other relevant data. the view that the agreement will

In addition, the two will be benefit future customers by dejointly developing and mutually veloping a full range of peripheral circuits rapidly, and support circuits which the

The Z8000 is claimed by the Specific details of this part of company to be the faatest 16-bit

A DISC drive with twice the capacity of the IBM 3300 and a charge coupled device memory offered as a direct siternative to the IBM 2305 fixed head disc drive are two products for IBM users being

Storage Technology

issues disc drive

challenge to IBM

lined up by Storage Technology Corp.
STC's president, Jesse
Aweldn, snys the high capacity

disc drive will be launched next

June, and will have double the

truck density of the existing STC

8350, which is STC's direct

alternative to the 317.5 Megsbyte IBM 3350.

memory is called FAM, Fasi

Access Memory, and will start to be shipped early next year. FAM

has a capacity of 44 Megabytes and will be able to replace directly up to four 11 Megabyte

IBM 2305 fixed disc drives while

offering a much faster accass

time - less than one millisecond and costing a lot less,

although the prices have yet to be announced.
The FAM is totally compatible

with IBM operating software and "looks" exactly like a 2305 to the system. Awelda pointed out that substantial orders have already been placed for FAM in

the US, even though it is not

shipping an intelligent disc sub-

system called VSS which will

use a CCD buffer and a control-

TO combat the effects of the

current shortage of suitably

trained programming staff, the Edinburgh-based consultancy,

Systems Consultants Ltd, has

inaugurated a special course for

By early 1980 STC will start government.

to "stage" data from disc into to Aweida, and at the same time

main memory. Awelda sees VSS it hopes to increase the propor-

as a smaller but much faster tion of its business outside the

version of the IBM 3850 mass US from the unusually low pre-

that there is a much biggar mar-

ket for VSS than for the 3850. It in the UK earlier this year which

newly-qualified graduates or the academic education. The course

storage system and feels sure sent level of 10%, to 35%.

hullt the company into the bigg- manufacturer, STC.

Course for recent graduates

The charge coupled device

out, aithough Zilog has already future. Early comparison tests started development work on some of the required parts, such have indicated that its minimum instruction cycle beats that of as a memory management chip which is due for introduction the PDP-11/34 minlcomputer. Each company will be responsible for the development of

Pepe Piedra, European director of Zilog, says benchmark shortly to sunstantlaie these

Zllog because, in the words of Both Sanders and Zilog preat a BCS microprocessor que.

He said the alm of the Z8000

design team has been to integrate the best attributes of the IBM 370 mainframe computer, and that in program handling, it should be equivalent to a PDP-linto the design of the new micro, into the design of the new micro, fallings of these machines.

details should be available two versions. The first, a 40-pin package, will offar a direct addressing capability of 64K bytea. An architectural outline of the Tha second, in a 48-pin package, part was given earlier this year will extend the address by Phil Pitman. Northern capability up to 8Mbytes, using a European marketing manager, memory segmentation techni-

while avoiding the architectural The device will be available in

Calcomp offers 300M byte drive for Series

COMPUTER WEEKLY, September 7, 1978

Sariea I CPU. But the customer IBM Series 1 minicomputers are will still have to write software now offered a range of disc aubsystems by Calcomp that can to enable the device driver to work with his oparating system. have drives with capacities of up to 300 Megabytes each. This A range of diac subsystems 84 Megabytes per drive cur-

with capacitles per drive going up to 240 Megabytes will be launched in the UK at the end of the year by Control Data as part of the Certainty series of The drives are Calcomp's existing removable pack Trident units that come in capacities ranging from 25 to 300 peripherals for Series I (CW June 22). Controi Data is under-Megabytes, Calcomp has dave-loped a controller and a software device driver to help the Trident atood to have a 64 Megabyte fixed disc drive on the atocks to compete directly with IBM.

Wartime aerodrome to be

THE site of the old Sergeants' Mess at the World War II West Malling Aerodroma is to be the home of one of the first implementations of ICL's new 2980-297X Common Storage Facility. The customer ia Kent County Council, which is currently equipped with two ICL 1904S machines, and the £2 million order includes one of the new anhanced 2978 systems and

access and store multipla access controllars, main mamory and disc units between a 2960 orde code processor and a naw 2972 or 2976 order code procassor (CW, July 13). This means that users with a large unconvartad ICL 1900 workload can estimate their final configuration requirement for the 297X machine, buy a 2960 order code processor, and switch the memory and disc.

The Common Storage Facility

The Plessey Peripheral System PM-DSYST-1 is a family of enhanced DEC 320 compatible, general purpose, time shared, disc based computer systems specially designed for business applications. It uses Plessey commercial systems 001 disc resident

The basic PM-DSYST-1 package includes central processor with 64 K bytes of MOS memory in an attractive chassis • a 5 or 10 Megabyte dual disc system with one fixed and one removable. cartridge • a video terminal or an impact printer terminal the PCS-001 software package.

will cost a lot less than tha 3850. Is called Storaga Tachnology Awelda left IBM in tha late Ltd, STL, to avoid confusion Equipment for system expansion includes additional cartridge disc storaga up to 20 Megabytea • dual floppy disc units with 512 K bytes • 45 cps Daisy Wheel printer or a 300 LPM printer • various 1960s to found STC, and has with the talacommunicationa additional video terminals or hard copy terminals.

See it working for you.

To allow you first hand experience of this remarkable develop-ment, Plessey have arranged a series of "hands on" demonstrations around the country.

Come along to the hotel which suits you and ask your questions Come along to the note: which suits you and say your questions discuss your applications with the technical people, and see for yourself the simplicity of this advanced computer and its capacity for work.

If you know in advance that you will be coming try to lat its know. Telephona Mrs George briMrs Wilson. Otherwise just completely we shall be very pleased to see you.

equivalent, covering all aspecta is solely for our own recruits, but is solely for our own recruits, but we feel that the computer selfof commercial computing and we feel that the computer service industry has a duly to carry markat place of a commercial out training programmes for computer consultancy, new antranta to the profession?

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Planes send me full technical literature on your new PM DSVST-1:

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Looking out for Big Brother

power of the Press, or mora specifically, the Press Association. The more peripstatic of you may have noticed that in at least a dozen local newapupars recently there appeared exactly the same story, under headloes screnning "Blg Brother is sat to take

AWESOME indeed is the

The piece, sent to provincial papers by the wire service, concerned the Fablas Sociaty's doom-ladan report on The Computer and Society. Sad to say, the alory had been written by a lay reporter who naturally enough had failed to detect all iha nonsense the Fabian report contained. So now, I expect. from Bridlington to Bristol people are walting with fear and trembling for that knocking at the door that means tha

the humans off to concentration camps. Tell them not to worry, computers don't

actually est people. Yet. A more chearful note is sounded in another Press item describing a new library bookissuing system: "Borrowars at Orpington library ahould not feel that 'Big Brother' is watching them when the new computer system is installed, says district librarian Mr Raiph Martyn. . . . " I expect this is because the library chose not to install the optional Monty Python foot that comes down on peopla who fall to return

their books on time. Very tolerant and Olde Worlde they are in Orpington. Or libaral. if many more microprocessor and microcomputer systems us pipeline techniques, will this allow the Plumbers' Union to step in and organise the workers?

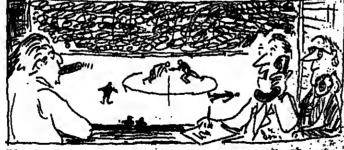
Spurred to action, VLI wins Chelsea derby

THE directors of the VLI computer aervices group are justifiably "over the moon" because they are to sponsor one of the top football games this season at Cheisea's Stamford Bridge ground, the London darby on November 18 with Spurs - the team spiced this season with a Latin

for this game, but VLI won. And in return for a sponsorship aum adjacent to four digita, VLI will get its name on the programme, advertising apace n front of the TV cameras (if there are any) and the opportunity to stage some special

like issuing balloons for the Sponaorahip for this game

does have a touch of irony for VLI managing director Rupert Bayfield, who admits that Tot-tenham was his "first love"



Chelsea fan and will ba de- commercisl reasons, according finitely on the side of the Biues,

The Cheisea/Spurs gama is only the tip of the blue leeberg as far as VLI's involvement with Chelsea this season is concerned. For the group, which includes the Computer People and Co-Operatora recruitment and contract staff consultants and the SIL syatems house, has also obtained possession of the most prestiglous box in Chalsea's new East Stand. The group will also have the main advertiaing space on Chelsea's new electronic scoreboard (CW, July, 27) and its name abpears in the school programme of a "foun ding patron."

Despite Bayfiald's support for Chelsea, the decision for hardreaded was taken for hardreaded with the club was taken for hardreaded was an impressed with the club for hardreaded was a mercal was an impressed with the club for hardreaded was a manual manual nations and hardreaded was a mercal was an impressed with the club for hardreaded was a mercal was an impressed with the club for hardreaded was a mercal was an impressed with the club for hardreaded was a manual manual manual man with Cheisea this season ia

"We have thought of ideas spectators, but have not decldad on anything dafinite yet," VLI marketing director Anthony Lambie told me.

amongst London League clubs. until he was converted to Chalsaa a faw years ago by tha hard-running young taam de-veloped by Eddia McCrpadie. But Bayfield is now firmly a "Another recruitment contract, sir — from a Mr Brian Clough

to Lambia, who is not personally interested in football After meeting Chelses's promotions manager ex-etal

computers have arrived to cart

London venue for

GILB'S MYTHODOLOGY

Standards less important than standard of documentation

REMEMBER the chaotic Sixtiaa? Beatles and undocumented programming. Many readsrs had not been born Into the DP ranks then, but the history of the panic reactions to the situation can be traced. It can be in the current program documantation standards.

Admittadly some stondardised order is preferable to low quality incomprehensible, uncommented asaambler language programs. My point is that documentation should not be a

The reul goal should be ecngnised clearly at the initiotion of the work, and if the customary documentation cehnique la more costly or less effective than the project regulrements state, then the project team should be liowed, or even be required, to dump tha standord in favour of some technology which meets praject goala.

The one great advantage of orcing programmers and anaysts to produce mountoins of conventional written "maintenauce" documentation is that nobudy has to exercise proessional ability in order to find a better alternative.

Tradition, the Fiddler on the loof shouted In his sung, ond or some, mediocre results by rodition are preferable to excellent results by the exerciss f aome professional knowl-

There are so many effective altematives to the traditional program documentation available today, that I believe that there is some set of them which will always meet project gnals better than any of the conven-

A GAME theory approach to

computer security is claimed by

I. P. Sharp to ba the key feature

set up by the company in North

Offered by Sharp's Special

Systems Division and almed

particularly at industry, the ser-

vice is based on the idea of cou-

pling risk analysis with coat/ benefit analysis of proposed

Lልጠልበበል

dd ASR to your KSR

30 cps punch reader

of a consultancy service newly

I have touched upon some of the alternative technologies in earlier columns, and there are many more flooding our pro-fessional literature. The key to recognising the alternative or supplementary technologies is to think in terms of the maintainability cost ratio. How much maintenance ability and what what costs for devs Iopment and during actual mointsnanca?

Any alternotive technology then compared to your conventional standard for program documentation in terms of how much it helps maintenance programmers understand programs, make changes and confirm the correct workings of those changes without unseen aids effecta. Cost, clock tims, human

effort and resulting reliability are factors to be evaluated The canventional objection that If we don't have o standord, then different people

will not be able to understand One reason is that many of the replacementa for conventional documentation are automatic aids for tracing errors or program workings, and

people who have learned a Another reason is that most of the alternatives are immediately obvious to any professional, and either more effective in maintenance work If they are better in these ways

totally secure systsm," noted a

spokesman, "as any syatsm can

be broken, given sufficient time

"Our approach is based on

companing the costs liable to be

Incurred by potential mallclous

agents with those liable to be

incurred by the potential victim.

We can then avaluate the ben-

efft of enhanced security

they are not dependent on



then the fact they are diffsrent from convention is not

It is just an attempt to avoid necessary changs by manage-ment which is not doing ita job of serious evaluation of potsn tially better techniquas.

One of the most important trends in program documenta tion has been the effort to make the programs themselves far more readable. High level languagas, modularisation. structuring, indentation and cominents all contribute. The old crutch is no longer necessory, but it persiats due to organisational momentum.

Other trends ara automoted evaluation techni ques such as distinct software where the documentation is expressed in an executable program for direct compar n: and in extensive file and Ivsis or database diagnosis programs, which identify errors or side-effects from

maintennnce change. An extensive list nutomated alds was published n the IEEE "Computer" July 1977, and many of the mor recent ones are discussed a length in my Software Metrics

Glib's Hypothasis: Most of our currently common documentation lechniques for program maintenance can now be replaced by more effective technology. The reason is mainly that the cost relation ship of people and machine has changed dramatically more automation is needed.

Sharp's analysis follows a

three stage process. The first is

of alternative security schemes.

Time sharing operating system from Shade for Interdata 16-bit minis

A TIME SHARING operating system for Interdata 16-bit minicomputers has been developed by Shade (Computer Services) of Caine, Wiltshire. The activare, MTX, is fully compatible with Interdata's DOS R04 operating system and can support up to 15 user terminals. Targeted particularly at existing DOS usera, the system offers a convenient path to multi-user operation, notes the company, without Involving either file conversion or changes in system command language. A 64K byte machine running under MTX would typically be used to support three or four concurrent users, according to Shade.

Memory requirements for the perating system are around 18K, though depend partly on the configuration. A further 245 byte control area is required in each partition.

SOFTWARE FILE-1

The remaining memory is allocated by the usar at switchon, using MTX commands which define the number of partitlons and thair size.

in the aupport of muiti-user activity, the aystem in some cases permits code sharing, by providing for re-entrant program execution. One auch inatonce is the Basic interpreter. The company has implemented Interdata's R03 Interpreter as a pseudo extension to MTX, so that all partitions can access the

Re-entrance is also supported for some library functions ond work is currently under way on adapting Interdata's Fortran run-time library to maka it re-

Although compatible with DOS system command language. MTX in some areas offers extension, such as a macro facility. The system also sup-

ports printer and plotter spooling, up to 16 accounting codea per user, password protection of user files, and facilities for broadcasting from the system console.

If implemented on a machine including a real-time clock, the software allocates each uaer a 30 ms slot. However, the system will also operate in event-driven mode where a clock is not pre-

MTX is priced at £1,700, including one year's warranty. Subsequently, there is an annual maintenance charge of £200.

Futura development of MTX originally commissioned by an undisclosed customer, could include a version for the 256K Interdata 8/18E. Currently under evaluation, this software would provide slx user partltions, each of 32K.

Shade, which has extensive experience of the Interdatn range, was previously best known for its DOS-compatible Impos multi-tasking operating system (Software File, March 18. 1976). Over 20 of these have now

Character string handling package for Fortran IV users

A CHANCE to jump the gun on Fortran 77 in respect of character string handling, is provided by a set of functions developed by Software 70 of Anahelm, California. The package, String 70, pro-

oble length character strings, both individually and in tubles. Manipulations passible with the software include string comparisons, string mayes, and string searches, the latter alawing fur multiple occur-

the string being searched. Facilities are also prayided for string deletion (ie substring deletion followed by compression), string inaertion (le substring insertion followed by concute-

search, entry insertion, and en-

II is priced in the US at \$70.

Elastic-plastic analysis

FOLLOWING the takeovar of

The plastic onalysia system is advocated in the draft of the new Code of Practice, for steelframed buildings B\$.20, and is being used increasingly in the construction industry.

alysis on two-dimensional frames of any shapo.

Misam file handler updated

a text aditor have been added by Flietab Support Sarvices in the DEC PDP-11 file handler. A systams programming

facility, File Maintenance Sys-tem offices the user to create or maintain both Misam-Indexed dota files and any data file indexed by logical record number. Written in Basic Plus, it is cinimad by the company is reduce greatly systems design ond programming time for file maintenance.

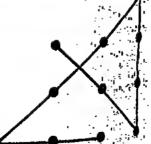
Also included in Misom Mk2 is Tad, o text editor running under RSTS/E. Ted may be used both for editing formatted
Ascli fileo and for amending program cource files in Basic of

Migans a multi-Index multi key occess method which runs under RSTS/E on POP-I1s. wos originally developed by a Conadian systems house. The new version was partially deve-inped in the UK by Filelab Sepport Services, which recently relensed RPL, n decision-table based language for the POP-II (Saftware File, July 27].

Fortran 77 standard

THE US standard for Fortran 77 was published in July and can be ordered in this country from the British Standards Institution. t)rders for the document, officially titled ANSI Fortran X3.9 -- 1978, should be addressed to the Overseas Sales Dept, BSI, Pentonville Road. 'anden NI.

Puzzler



ACCUSTIC COUPLERS.

Euro/US conference A JOINT European/US con-ferance on software management late be hald in London in Octobar. covered include life cycle costing, software verification and valida-tion, project auditing standards,

fence initiatives will be a melor thems of the conference, which will also review progress in soft-were technology and actual pro-lect experience Particular areas of concern will

include common high order for Nato. men, under way in the US and Garmeny, and recent EEC moves on software portability (CW, on software portability (CW, 1994). anguage projects, such es Iron-

Recent US Department of Da- and requirements specification

languages.
There will also be presentations on software management experience in the European Space Agency and the development of Commend and Control systems

The conference, the third in an August 10). Row, London WC1. 01-242
Specific technical topice to ba

SIR goes into SIA

A DATABASE management system which interfaces directly with the widely-used SPSS program for statistical analysis has been instolled by the London bureau SIA. The system, SIR tegrated tool for data organisa- store tham in SPSS SAVE files. tion, storage, and analysis.

with the BDMP sulte, supports without having to write a special hierarchical data structures. A extraction program.

Bradford graphics

package offered

A GRAPHICS package developed at the University of Bradford is to be offered free to other

universities under a sharing agreement, and has already been installed by the University of

Manchester Regional Computer Centre.
Called Simpleplot, the software provides facilities and three-

ities for plotting two-dimensional and three-dimensional graphs and is particularly intended

The package, written in Fortran, will also be made available to industrial and commercial

users, initially through the Bradford University

versity for nearly five years and has been implemented on ICL £900, CDC 7600, and DEC PDP-10

systems. A version for IBM 360/370 equipment is

The software consiats of a set of subroutinaa

for each component of the plotting process, from drawing and labelling axea and keys to drawing elther smooth or broken curves through a aet of

A feature of the package is the close relation-ship between these instructions and the stepa

involved in producing graphs manually. The software is thus claimed to be more accessible to

At the same time, it can produce a wide range of high-quality graphs. In addition to plotting

histograms, contour graphs, and hidden-line surface drawings, it can handle linear, logarith-

mic, or polar axea and Smith charts.

Simpleplot has been in use at Bradford Uni- 710.00 to 2.03

free to other

universities

for use by engineers and scientists.

Industrial Liaison Office.

iader development.

non-apecialist users.

vides facilities for hierarchy manipulation, report generation, and file security control.

The system, which operates in either batch or interactive mode, (Scientific Information Ratrie- also allows the user to extract val), providea users with an in-This provides an economical SIR, which also interfaces way of analysing data subsets.

1- 1---

210.00 10 2.01

MoD orders Mascot kernel for use on F100-L of a Mascot kernel for use on the control aystem, in which each Ferranti F100-L microprocessor. processor will hold a minimum, The contract, ploced with Y-Ard stripped-down, software configuration.

of Glasgow, calls for delivery of an initial version of the software However, the kernel will also by the end of the year. be configurable in development At the same time, the exversions, for running either on a pected first application for the software neatly demonstrates standard F100-L development system, or on a hosted aoftware the Miniatry's aim of achieving development syatem. application system portability The facilities provided, for hrough the use of Maacot, which is understood to be under

consideration as a standard for

real time defence computing

for the scheduling of concurrent

application tasks or, in Maacot

To be written in Coral 66, the

(CW, August 10).

CALL DARIENTE, 100, 100, 11 .0.15 .00

CALL SOLID(Z.100.100.10.0.10.0)

varying complexity, depending on the configuration of the system to user requirements.

Y-Ard has already developed, and aupplied to the MoD. a Mascot kernel for the Intel 8080 microprocessor. The new executive will use the processorindependent portions of the existing kernel, according to a apokesman for the company,

control system for ahip power plants. This was currently based on 8080a, but the MoD was keen to replace some of thase with Ferranti processors.

could not yet be determined in detail but would depend very The facilities provided, for example for error reporting and writing supplementary and the facilities provided. Figure 1. The facilities provided and its development will involve writing supplementary and the facilities provided and its development will involve writing supplementary and the facilities provided. much on the efficiency of Ferranti's Coral compiler for the

PROGRAMMER NOTES

real time executive will provide OLD soldiers are said to fade away. But where do young programmers go?
Anyone involved in recruiting

terminology, activities. It will also provide facilities computing staff is aware of an for peripheral interfacing notacute shortage in two main ably a serial line handler and a areas: Cobol programmers with about 18 months to two years' DMA handler, and an Interface to a real time clock. experience, and specialist pro-The kernel is intended portigrammers with four years and cularly for memory resident plus experience. applications, where no backing

One cause for these shortages store is available. The typical has obviously been the failure to develop sufficient new trainees, together with a perhaps inevitable but short-sighted Inclination among employers to look for the experienced programmer rather than investing time and money in developing trainees.

In a recent urticle (CW. August 24), the director-general of the Computing Services Association, Alan Benjumin, called for an end to the carrent frenzied scene on the computing employment market, and for employers and employees to take a cool look nt their longterm objectives.

Have Cobol.

As he pointed out, there are failures on both sides in developing computing as a long-term

Programmera tend to be more loyal to their subject specialisation than to their career within a particular company or user in-Others in the Industry would

go further than Benjamin in suggesting that too many young programmers, having landed in a scene with an overwhelming number of vacancies, good money and a generally easy life, have found it all too easy to drift from one job to another without ever really taking responsibility for seeing projects through. The acordity of skilled people.

burgeoning new projects and computer applications, and a

ment from tackling the tricky problem of managing the highly articulate and often temperamental programming com-munity, have helped to build up a wide market for contract ataff.

Although the nature of many computer implementationa with peaks and trougha, would inevitably create such a requirement, it is all too easy for young peole to drift into contract work for a number of years of easy, no-responsibility ilving.

This still does not answer the question of where the programmers go when they grow older.

Having Cobol PL/I or Fortran is still sufficient armoury to enable n programmer to survive and prosper doing his or her "own thing", and there are sufficient job vacancies to enable nny programmer wishing to

settle to find a cosy niche. But is there sufficient commitment from programmers to their career/profession which

has given them such a good start certain uhdication by manage COMPUTER WEEKLY/IDPM WORKSHOP

Computer Weekly in association with the Institute of Data Processing Management present

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THE DATA PROCESSING DEPARTMENT AND THE USERS

Tuesday, October 17, 1978, at the Holiday Inn, London

Because DP is a sarvies function, it depends on its usars for ultimota uccess. But users from the Board to the ahop floor differ in needa and. outlooks and as they grow in power and numbers their attitudes can make or break the fortunes of DP.

This practical workshop, to be run by Nigel Laurie of Communicationa t, will help delegates to diacovar the techniques and approaches that work best in helping to managa successful user relations. The workshop is practical and based on experienca. Above all it is. participativa so that delagates can put tha theory into practice. A summary of a survey conducted at a previous Nigsi Lauria workshop on this subject. was published in Computer Weekly on May 25,

For this latest workshop the number of participants will be limited in order. of participants will be limited in order that the maximum benefit may be achiaved. If you would like to reserve a place please complete the application form and return it to the address shown, not to Compiler. Weekly or the IDPM: A brochure giving further information about the workshop may be had from Tony Swain, BIT, 40 Bowling Great Lane London ECI DNE.

To: Conference Administrator, IPC Business and industrial Training, Surrey House, Throwley Way, Sutton, Surrey SM1 4QQ

Telephone: 01-643 8040

Plaasa reserve......places for the Succeasful Usar Relations Workshop to be held at the George Strael, London on Tuesday, October 17, 1978, Tha fas is £50 (plua VAT £4) for mambers of the IDPM it ia £45 (plus VAT £3.60). This covers ettendance at the workshop, coffee, lunch, and fee and full course

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risks and their likaly consequences in the first two phases is vital to the task of selecting

appropriate security measures. in addition to conducting complete analyses, Sharp will also undertake to train clients in computer security and to make a fixed number of security Inspection at a client's installation at random intervals throughout

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the enumeration and evaluation

of assets, second is the determination of potential threats. and the last is the investigation of the relative merits and costs in the latter context, the compacy notes that security measures may in general be aimed at

vides collable Firtran IV auli-Sharp approach to computer security routines for operating on vari-

reneas of the search argument in

nation) and string replacement. 'Table hondling functions include table creation, hinnry

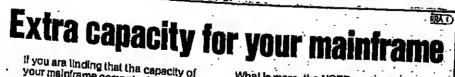
try daletion. String70 occupies less than 1 K bytes of memory and is supplied as a sequenced source deck together with a source listing

Electronic Calculus Ltd, University Computing Company has added in its inventory a series of ECL-developed progroms for elastic-plaatic structural analysis and design, .

The ECL system, PLSTIGE uses the direct stiffness method and performs elastic plastic an

THIS tracing problem, calling for nine dots to be joined up with four consecutive strokes (with four consecutive strokes (which out lifting pencil from pencil fro





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Three linked exemples of Simpleplot output

CRLL SLICED(2.100, 100, 12.0, 15.0)

NORD - the system to build upon.

So where do companies find the people wha possess these branch represents some 1,300 attributes or, more to the point, just how do operatora get into operations?

Of course, we have the trede papers, such as Camputer Weekly, which odvertise jobs in abundance. But the great pro-blem is that potential or budding oporators nro often unaware hat such publications exist.

Putential entrants are in a vulnerablo pasition because they rarely know whot the wark ls likely to entail; all they ure aware uf is that it is to do with computers ond, therefore, will have good career prospects. Hence their enthusiasin aften lends them to accept the first position offered

However, there are twa government-sponsored schemes hich are of considerable value in this context. These are the Training Opportunities Scheme. TOPS, and the Threshold Scheme argonised by the National Computing Centre. Bath of these are good be-

which ore equally strang on theory and practice. Students are sent to sites in order to get an mittee have suggested that the ideo af what the job is all sbout. Op Spot would like to hear

your views on recruitment. How did yau enter operations and does it live up to your hopes? HINT OF THE WEEK

MODIFTING printers in the ISM
OS/VS1 environment is the subject of a technical hiet sent by
Richard Peet, an operator at the
Nottingham site of the Eost
Midland Electricity Board.

Sections "The apparations with

Peet says, "Is accordance with

our installation standards, we

give special forms a four-digit

operators of the carriaga loop to be exed by meses of his rue card.

whee the job concerned has

shift leaders

Modifying the printer

PO careers must be structured

Its dependence on the Isrger ICL mainframes and introducing minicomputers on a broad scale must be accompanied by greater career progression opportunities for the opsrstors whose jobs

This massage came across loud and clesr in sn Interview with Charlie Addiman, who is secretary of the Dats Processing Service Branch of the Society of Civil and Public Servents. The senior operations and project staff in the Post Office.

in theory, it is possible for Post Office operations staff to transfer into programming positions, and vice versn, but in practice this rarely happons. At the last quarterly meeting

of the branch committee this was one of the matters discussed, and the union brought Ihis to the attention of the Post Office managament. In response, a circular was sent out to opan to both operations and systems and programming. programming staff.

qualified as programmers for do not have systems and propositions in software support. in gramming sactions, so if the fact, operations experiance operators want to move into would probably provide a better grounding in this respect." Members of the union and

Post Office management have formed a committee with a view cause they have syllabusea to praviding more formal

"Union members on the comoperstors sra sent on a basic programming appreciation caurse. We believe that this should be followed by one on

The union is waiting for the management's reaction to this and will follow it up with other

suggestions.
Although he is quite satisfied with the progress made so far, Addiman can foresee difficulties employees stating that certain for some of the operators who positions in software support are wish to move into the areas of

Ssid Addiman, "This is fair, come into play," he said. "At the becausa operators are just aa Edinburgh site, for instance, we "Geographical considerations those disciplines they may well have to relocate to London.'

He disagrees vehenishly with those who srgue that operators require little skill or expertise. "1 am not saying that the Post Office holds this view, but it does seem to prevail throughout the computing Industry".

Addiman points out that, by the very nature of their work, senior operations staff are often put in positions where decisiona have to be made. This, he argues, is good misnagement training.

When it comes to management, who is going to come off less than they will affect those

charge of a night shift, or someone who has come from systems or programming?

"The shift leaders at our large sites are used to shouldering a lot of reaponsibility. This experlence must be used."

Post Office sites at Derby Edinburgh, and the Barbican i London already have ICL 2900s installed and Addiman had this comment to make:

"These systems are supposed to require far fewer operators with this view. We base our estimations on our own research upon the facts and figures sup-plied to the Post Office by the

manufacturer of the equip-

Of course, any Post Office activity which directly affects its members is of concern to the Jnion. And he was keen to stress: "Portsmouth, St Albans and Kensington are threa sitss which have been in danger of closure in the past, Now, however, we are much more

optimistic about their future." According to Addimsn, tha Post Office is considering the Introduction of minicomputer systems at its philstelle bureau in Edinburgh. At present the buraau'a computing needs are catered for by the Leeds instal-

The union is not sgainst the use of minicomputers as such, providing they are used on the same premises as the machines they replace and operated by tha same staff: "We would not stand in the way of progress just for the sske of it. However, great attention must be psid to the operators whose csreera may be fected by It."

in fact, he considers that minicomputers will affect operators in the Post Office far

best — a guy who has been in employed by other concerns. **VDU** operators 'need regular eye tests'

SOME experts consider that as system. Rather than giving the many as 33% of the employee population have visual defects which are completely untreated, or inadequately so. Using VDUs therefore tends to affect both

their visual and general comfort. VDU operators should be given the appropriate eys tests on selection and, if necessary, fitted with spectacles. in addi-

Fxxx, PAUSE= DATASET

soveral steps, with each producing output of e different formst end therefore requirieg have all been printed, remodify He continues, "The problem is time a different type of ferm is that the system keows the cor- required."

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give special forms a four-digit operators might watch the printer and wait for a change in the format being the maximum silowed on the JCL OUTLIM parometer."

Now if a programmer of the printer and wait for a change in the format being produced. This is both boring and time-wasting. Now if a programmer at the sits wishes to test a saw print formet os plain stationary he codes 1118 esd leforms the

MODIFYING printers in the ISM ract stationary is on the printer

pooring and time-westing.

Poet's answer is meet: "Use the
MODIFY command to lestruct the system to pause and seed the operator a message each time a dataset has been printed."

but is unawere of the need to change the carriegs loop." Left to itself, the system will

simply print all the datasets with-out telling the operator to change

To overcome this, one of the

This is achieved by the followleg 08/VS1 comm

tion, tests should be carried out regularly.

These are two of ths points highlighted in a report by Rachel Bimbaum, an ergonomist at the London School of Hyglene and

> The report goes on to stress that persons suffering from cataract should never use the units, and that those who wear bi-focal apectscles are unauitabls ss they would have to adopt a posture conducive to is ligue. It points to the direct relationship between eyeatrain sind the flicker, glare, reflections and varying brightness of the

It states that eyestrain is also made worss by personal factors by such as ganaral fatigue, ill-health, the use of certain druge, glight-sensitivity and a pervous disposition

operator s chance to rest, this leads to stress as he must rems in alert in order not to miss the data displayed.

When overburdsned in this manner, VDU opersiora often complsin of stress-fstigue symptoms, including depression, weariness and exhaustion. They slso display less efficiency. In conclusion, the report puts

forward some suggestions. They VDU operators should be given regular eyesight checkups, which should be carried out Tropical Medicine, entitled Tha during their normal working day

Hesith Hazsrds of Visual Dis- to produce valid results. ors should have regular breaks from the units. Efforts should be made to

By Bernard Allen | Language range wins varsity order for Nord

LOOKING for se expondablu minicomputer system with n wide range of laeguage compilers in which rune on all models in the equip its naw department of line. "We had to know that star. computer science, Exeter University has settled on a Nord-10/S tion our installation could gave into one much larger." sity has settled on a Nord-1075
system from Norsk Dota of Norinto one much targer," comments
Professor Campbell at Exeler.

Language compilers available on the Nord-10 Include Corni 60, the Nord-10/S will be sup. Lisp, Simulo, SCPL, Pracri nnd portest by Norsk Dato's UK agent Dictional Norten (Nord) Lid of the Nodel process control language, as well on the usual Fortran, London, II Cobol, Basic and RPG-II. The eight termin London. II will initially support Firet half figures from Nord computer is to be used for Doin show timiover up 40% et tesching and for the study of

languages and compilers. 62 million Norwegish Kroni Priced et under £35,000, the (about £8.2 million) company 62 million Norweglan Krons Nord-10/S configuration was with the same period lest year, chosen in professence to a number Experts occounted for 40% of of offeriegs from compenies output. Following the opening of which included DEC, Prime and a Poris office onlier this yesr, a Gormon office is to be opened Strengths of the Nord lies in- this mnrih.

which makes it illegal for Post

Office staff to reveal either the

contents of a telegram or the

fact that one has been sent by

Luddites, and are certainly no

against the use of computers in

fact we believe that computer

annunts of medicul data. But we

must ensure that any new sys

tem is the most appropriate t

way endanger the persona

relationship hetween doctoraid

Committee is particularly wor-

ried that the proposed DHSS

child health system is to be imp-

workstutions to use the 9.3

Megabyte disc drive supported

niso to share periphernis like the

Another important facility

provided by TRS is telex not-

work interfucing which enables

The BMA Central Ethical

Dutient."

our needs, and does not in any

rinciple," sald Dr Thomas, "In

'Docturs are not neg-

particular persun.

than the machines previously used, but we do not wholly agree with this view. We have a control of the view we have a control into the matter and do not rely upon the facts and figures supplied to the Post Office busy to CONCERN over the privacy to the Wireless Telegraphy Act,

safeguards relating to the child health databank proposed hy the Department of Health and Social Security (CW, May 4) has led doctors to call for new legislation which would make it illegal for unauthorised persons to reveal the contents of medicol

Dr Michael Thomas, of the. Central Ethical Committee of are the only practical way of the British Medical Association. storing and accessing large which is lobhying for stricter control over the confidentiality of medical records, told Computer Weekly, "We are concerned that in a centralised national databank of medical information there would, under present low, be no legal safeguards to prevent sensitive facts about individuals being revenled by clerks with occess to the files.

"We would like to see n licw which makes it illagal to revent not only the cuntants of un individual's record, but the fact that it actually exists. This would operate in a similar way security.

lemented on an existing batch system. The ductors believe that unly a real time system with effective password controls rnald offer adequate dall

Office challenge TRS also embles the System 5

• From front page

IBM is also believed to be developing an advanced facsimile by the Series I in store and device and some observers he- acress large volumes of text and lieve the lnk jet printer uvullidde ulso to share per with the Office System 6, which lnk jet printer. uses a micro chilp to control the printer typeface, could also he used for graphical output. IBM is also understood to buye phired is large order with Parodyne for 4800 hps modeins which randi be used as part of an electrodic mail sevanced communications

The text ronting system cnables the series to distribute documents and measoges generalsd un a clusier of System 6 workatations to muny fur the first time in public st the remote sites over telephone

documents generated on System B worksinilans to be cratveried naturalically to telex IBM lins been supplying te message switching, based on its System 7 minicompuler, for

some time. TRS was developed by IBM in the UK and is likely to be shown Sleob exhibition in Paris from September 20/29.

Growing market THE large potential market for The report siresses that there

automsted office systems has been highlighted systems has in creased interest in Optical bean highlighted in a report Character Reading equipment from the least of the second the International Dato for use in conjunction Corporation* which highlights the growth of total office sys-

the growth of total office systems including the intelligent copier (CW, August 24), facting a window, if they must be sited in the vicinity of a window, then the screen must be pisced at an single to it in order to reduce gisre and reflections.

On recent weeks, several readers have contacted me about the course of the signonomics of VDUs to be run by the Institute of Ophthalmology in London on October 12 and 12 (CW, February 23).

According to Veronica

The growth of total office systems including the intelligent copier (CW, August 24), facting and other forms of text input and output.

The report, compiled before the iBM announcement of text routing systems (sea page 1), high lighted IBM's fallure to attinck seriously the shared logic market and says that the word processing market is still "unstative depends of the staturated" despite IBM's computations in paraturated despite IBM's computations made worss by personal factors such as ganaral fatigue, III-health, the use of certain druge, light-sensitivity and a nervous disposition.

In the normal course of events, there is a lapse between the input of commands or data and the response given by the institute, the course is now planned for next year.

by the Institute of Ophthalmology in London on October 12 and i2 (CW, February 23).

According to Veronica Reading, who is a lecturer in tha Department of Visual Science at the Institute, the course is now planned for next year.

by the Institute of Ophthalmology in London on October 12 and its dominance of the tha future of alectronic general and its dominance of the tha future of alectronic general and its dominance of the tha future of alectronic general and its dominance of the tha future of alectronic general and its dominance of the tha future of alectronic general and its dominance of the tha future of alectronic general and its dominance of the tha future of alectronic general and its dominance of the tha future of alectronic general and its dominance of the than future of alectronic general and its dominance of the than future of alectronic general and its dominance of the than future of alectronic general and its dominance of the than future of alectronic general and its dominance of the than future of alectronic general and its dominance of the than future of alectronic general and its dominance of the than future of alectronic general and its dominance of the than future of alectronic general and its dominance of the than future of alectronic general and its dominance of the than future of alectronic general and its dominance of the than future of alectronic general and its dominance of the than future of alectronic general and its dominance of the than future of alectronic general and its dominance of the future of alectronic general and its dominance of the future of alectronic general and its dominance of the future of alectronic general and its dominance of the future of alectronic general a

processors now that problem low reliability and higher cost of

Lord Avebury told a group of from this state of affairs, he adyoung people last week at the vocated the widespread provision of viewdata terminals in Australian Computer Conpublic places such as libraries and post offices, together with As well as criticising unions for not giving a more effective lead in the progress towards a sovice and guidance on to use them. Citizens could log on to a viewdata terminal and get the direct ones. In particular, these included the increased

Avebury warns of

dangers to society

mapping oul for themselves the

best way of doing it," he pointed

To prevent conflict arising

'more leisured society" (see whole range of services, power of the military in the front page), Lord Avebury also said he believed that the market together with local information for micro-based personal comabout schools, recreationsl puters was more limited than facilities, housing and shops. Lord Avebury said he ssw many envisaged, although he saw growing prospects for the improved prospects for the smaller business coming from use of micros as "business systhe arrival of cheap but powerful tems" in the home and for the minicomputer-based systems smaller business. The home and office prospects for viewdata together with the availability of ressonably priced text processervices were slso great, he presing devices.
"Hitherto the benefits of comdicted, with far-reaching effects,

viewdata terminals in public

venting the use of computers

places could be one way of pre-

leading to grave social divisions,

although the ultimate potential of viewdsta was difficult to evaluate at this stage. In addition to the problems af could justify the substantisl social disruption caused by uncapital investment required." he employment, Lord Avebury said. "That gave the edge in competition to the bigger enterwarned that variations in the ease of access to computerprises, and it has been one of the hased Information could lead to ressons for the emergence of grave social divisions. "Just as huge corporations that dwarf the middle classes take better msny newly independent counadvantage of public services like health care or libraries because cessors, he said, would bring of their attitude to state and local suthority benefits and about a huge decrense in the their relatively good knowledge demand for clerical workers of them, so the same groups in society will be quickest to see

such as secretaries, typists and filing clerks, and he predicted the merits of participating in the that the growth of the electronic —...but no Big Brother

puting have been restricted to

the larger companies which

The development of text pro-

DISCUSSING the Issue of vices and more officient and privacy. Lord Avebury dismissed fasts that the growth of computer flies containing parannal informa-tion would inevitably lead to the kind of molavolant governmentol control depicted in George Or-well's femouenovel "1984".

"The liberty we enjoy is as aguarded by our general politice pholosophy, wherese the people who live in totaliterien states do not owe their snalevemont to the computer, but rether to the waskness of the represen-tative institutions they had before or to a continuing Iredition of authoritariselem," he said.

Among the many benefits to be derived from properly controlled administrative databanks, he said, were improved medical ser-

comprehensible systems of taxa-tion and social walfors. Lord Avshary predicted that within shout ten years eserly oil toxos and welfare benefits would be calculated and recorded by com-

puter.
"Computers shoeld ultimately permit the tax sed social security systems to be merged to crente a single set of income adjustment procederes ranging from total in-come support for someone with zero recources of his own through to the highest incomo, cepite gains or wesith taxas at the intrinsically fairer, and it would also be capable of modification at short sotics to suit chassing sconomic background coedi-

Store installs 84 VDUs

AN independent mail order firm, Empire Stores, has installed 84 ITT 3280 VDUs at its Brsdford headquarters to provide an efficient method of information retrieval, query answering and management decision-making, using the company's IBM 370/

158 and 148 systems.

Up to 40,000 orders are received at Bradford each day and these generate about 500,000 documents a week. Catalogues are printed and distributed to agents twice a year,

snd each issue cantsins up to 25,000 different items on offer. Empire Stores originally opted for a total iBM installation, but felt that the ITT plugcompatible equipment had advantages in terms of lower rental charges and more approorlate screen and character

Our picture shows Russell Smith, Empire Stores' correspondence manager, advising terminal operator Elleen Beetham on a catalogue query.



a pretty

NEW marketing campoign from communications specinlists Case of Rickmonsworth starts next week, featuring one of the most familior faces in the computer Press, Liz Rees.

to send a hard copy letter as it is

to send a telegram today. The use of paper in offices would

plummet, and the era of the

huge multistorey office block

He pointed oul that the in-

direct effects of computers could

be of grester importance than

superpowers, the sacisl in-

fluence of policy decisions based

on computer-run msthemstical

models, and the discouragement

of non-conformist thinking in s

society dependent on the com-

puter for many everyday func-

Rightly used, however, the

computer offered the oppor-

tunity for a tremendous enhan-

cement of the quality of life, and

of the power of the individual

"The route we take and the de-

stinotion we arrive at," said Lord

human race to choose."

would come to an end.

Under the heading "The Case olternutive," Liz hos been appearing in modern odvertisements over the posiyear, with an invitation to phone her at Rickmansworth. But Liz is not just a

photographic model; she is n product inarketing specialist ot Cose who has an honours degree in industrini engineering and speoks fluent French and Sponish. Liz joined Cose in 1975 os on

export marketing administrator. When she was oppointed to her current product marketing job, she was asked to handle the phone-in compoign and, occording to Case morketing director Christine Stott, it seemed o logical step to use Avebury," are still for the Liz in the adverts.



COME OTER WEEKLY, Behreunder V. 1879

Sporting a new hairstyle, Liz Raes will be eagarly awaiting meltidro phone cells. Piens to dangle har from e perschute to maho the poli hically have, wa think, baan dropped . . .

"Computer Weekly", "Data Processing" and "Systems International" present

Britain's major peripherals and systems exhibition Olympia, London, December 5, 6 and 7

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Now in its eighth year, Compos is bigger pulpherals, amuli business systems and Ihan ever in its new venue and featuras

a wide choice af computer

mini and microcompulats. Hera aro aoma ol tha 200 exhibitors:-

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Commodore Systems
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Disblo Systems :

USCL Microsystems Varsatec Electronics

the middle of the picture, presented silver medals to the transatiantic alloonists, Don Cameron (left) and Christopher Davey (right), for their

brave attempt to cross the Atlantic Ocean by ballonni. In addition to supplying the high-frequency radio transceiver, Rucal installed all the radio and navigation we are ver equipment used during the flight and their help."

THE deputy managing director of the Racal Electronics Group, seen in the middle of the picture, presented in established at the Group's Brac-

The attempt, which was thwarted by had weather, ended when they plashed down 110 miles off the coast of France. At the presentation the data management group.

Joining the group from Cincom
Systems, where he was a project Davey salil, "Dur HF sel was the only thing we didn't have trouble with, We are very grateful to Racal for

We're having a Ball!

COMPUTER WEEKLY

CHARITY BALL

Friday October 13

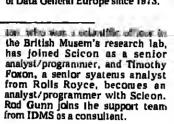
operations in Europe EUROPEAN operations of Data general manager of international operations with the medical systems division of the US General Electric. General will now be headed by Jim president and general manager of Data Ganeral Europe. He succeeds aarry Fidalman, who returns to cor-Before that he was with Motoroln where he lield several positions in international and European operations, and most recently was director of international operations, orale HQ in Westboro. Aassachuselis to fill the newlysrkeling, Americas/Far East.

Fidelman has been vica-president Finke's previous job was that of of Data General Europe since 1973.

Roger Tagg. John White and Erle tran who was a sciantific of low in Cook, management consultants with Scicon, have taken on new responsibilities. Tagg, who has been the company's senior consultant in the database area for several years, takes charge of the conaultancy and IR business. While, who has been leading a data management project, tskes over the implementation side and data management in the field of defence. Cook, who leads the management consultancy team, lakes on additional responsibility for

Finke to head DG

ave been appointed directors of field, previously chief accountan and company secretary, is financial director; Finer, whose Ille is leader/consultant, is David Dant, who will be a consultant. Nell Barnow sales director, remains head of



Patrick Bransfield and Pelar Finer Corp. ACT. In New York. Her vious joh was as PR executive with Ken Baynton has joined Borer

Electronics as technical sales support manager. Previously he was UK gineering manager with Raentiligo. Dave Dye, a former computer peripherals sales engineer from Ampex, has become senior sales engineer with Borer, and Doug Prewer, who was a Post Office en-gineer, has joined Borer as-a field ervice engineer

Wyeombe, Bucks, as his Enropean

marketing executive, to he respons-

lble for establishing and supporting

distributers of the commany's range

of Video computers in Europe. He was previously divisional manager

of the packaging department of

Sales administrator is Shellu Thomas, fromerly in sales at Ross Foods; Ann Tuffley, previously Ampex, has joined the Borer team in



heen unde at Redifon Computers. Richard Hickman, having rejoined the company in December 77 as territory manager has now been the London branch. He was with Redition from 71 to 74 and from July 74 to December 77, he was with

Ken Howman has been appointed territory manager for the Southern branch and will be based at Stowmarket. He was previously a sales executive within the company. An-other appointment at Redifon is that of Phil Sariorius as costomer services engineer for the South West branch. He has been with the company in a similar capacity since August 76. Also to join Redifon is Sue Circher as a senior systems nnulyst. She was previously an operational research analyst with 8P Chancals.

has been appointed sales director until recently he was general sale

> successive decade, and are expected to do so in the coming decade. So the world championship might be expected to fall to a machine in the late 1980s. Estimates based on such ex-

California. SEPTEMBER t3

SEPTEMAER 13-18

SEPTEMBER 18-22

Gelling cost control accepted, sealing Association of Propert Managetif Association of Propert Managetif Association of Cast Engineers, Belly Hotel, Manchester, Details, M. H. Drabs 081,278,2011

VME/K subgroup meeting, 2000 User Group, Nurlimal Liberal Clab, London SWI, 10.30, Micro coftware, Block Walter, OPMA Example of Communication Palaster

Liveware Saga WHAT'S THIS - COMPUTASTARS AT CALLANISH ? HAVE THE STERDID OR PARAVOID ? MEMORY DIST

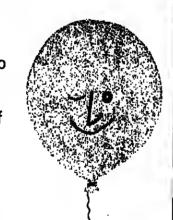
at the Royal Lancaster

Last year more than 600 people attended what has come to be regarded as the computer industry's big night out. This year the Ball will again be held under the patronage of

Computer Weekly is holding its third annual Charity Ball.

the British Computer Society, on the eve of the Society's 21st Birthday.

Proceeds will once more be devoted to a charitable cause within the computer industry. So why not help us to help others, and at the same time enjoy a pleasant evening with friends and colleagues.



COMPUTER WEEKLY CHARITY BALL

Tickets are available at £12 for a single ticket. Included in the price is a dinner, cabarot and dancing until 2 a.m.

Please ared mo augle tickots at £t 2 per head jenter

Please reserve infide(s) for no (CO places at \$1.2 par head)

My chequo for E le ntischad chemins should be made hayable to IPC Business Press!

When complaind this order form should be returned together nth your cheque to Chris Howell, Publishing Orector, Dorset House, Stamford Street, London SE1 9LU.

Pieces send the tickets to me at the following addrece:

CZA, a firm of management consultants in market research in Susan Croft hus been appointed markeling support manager with Advanced Computer Techniques

lan Forbes has been appointed by acquard Systems of High

Bo Briggs of Marconi Instruments

Ted Fdwurds, formerly marketing manager of Dataplex, has been appointed territory manager, word processing systems with General

Non-invisive cardiovascular measurements conference. NASA/Stanford Halversity. Stanford, Culifornia.

SEPTEMBER 12
Computer programs for project control, senting. Association of Project Managers. Waldorf Hotel, Landing WC2.
10.00. Details APM, 01-709/3182
Computers and the project for the control of the project of the control of the project of the p

Computers and the milons. Cilve Jyn-kins. BCS 1978 Lecture Series, London School of Economies, Lundan WCZ, 19.30. How do we use II?—how to monitor and control the day to day recognized

How do we use ht — how to mounter and control the day to day running of the system. Albert Stacey, BCS Group for New or Potential Users, Royal Angus Hotel, Birmingham, 14,00. SEPTEMBER 12-14 Computers in cardiology contenence, IEEE/Stanford University etc. Sinnford, California.

Meeling, CMC Users' Association (CUMAC), ITT Ltd. Saxon Molel, Unrhow, Essex. 10.30. Debilla: Moldenhead 20525. Nascon J. Alan Tonill. Association of Indopendent Computer Specialists. National Liberal Club, London SWI.

Software house, friend or far. Vh-Groves, RCS Leeds branch, Parkway Rotel, Leeds, 1830. SEPTEMBER 13-14

Scottish Group meeting, IIIM Crim-puter Users' Association, Enrocrest Hotel, Edinburgh, Oatalls Mrs Speciale, 01-551

Jackson design to harque, workshop Marcus Broutherper, Dopt of Compact Science, University of Strathelyde, Gugow. 9,30. Petalls from the Condawn Education Office at the University of 011 552 4408, exc 2132

SEPTEMBER 19

1601-28 2011.
Performance evaluation, Prof C Sand 1015, Reading branch, Copper in.

Proglomme, 2000.
SEPTEMBER (0-21
CARCAR transporter added designed manufacturing conference and exhibition. Computer and Adomatel Systems Association. Los Angeles.
SEPTEMBER 20
VMEE subgroup position, 2990 Use

Micro software, Blek Waner, Orosa Essex heanth, County Hotel, Rainford Road, Chebusfurd, 20,20. SEPTEMBER 20-21 Local Authorities Group meeting, IBM Computer (Essers' Association, Central Regional Council, Stirilag, Octalis Mo etale, 01-551 1043. St.PITMINER 21

Landon, WC2, 18,00. SEPTEMBER 21-23

Sympashim on interactive techniques in computer-olded design, IEEE Com-puter Society, Bologna, Italy.





computer program beat not just

David Levy but the chess cham-

pion of the world?" Provided

that basic program designs for chees-playing remain roughly similar to those of today, an

answer of a aort can be con-

atructed from the chiet repro-

duced here, which I owe to

Monty Newborn, author of Ost-

rich and chairman of McGili

Program strangths In US

Chess Federation rating units

are plotted against "brute force" search capabilities expressed on

a logarithmic scale. A sur-

prisingly good approximation to a straight-line relation emergas.

this scale we would conclude

that the world chess champion

could be beaten by a program of

today's type able to examine 40

million positions in look ahead

when choosing each move. This

corresponds to a hundred-fold

Increase of raw computing

power beyond today's level.
Advances of computing tech-

nology have so far developed a

hundred-fold increase in each

chalks up

TWO years after it was set up, Computer People North, the

Manchester based member of

the VLi computer aervices

group, has achieved a £1 mil-

ion a year turnover as well as

giving rise to Computer People

Midlands, which is operating on a £500,000 a year turnover

Most of the turnover comes

from the contract staff opera-

tions of Computer People

compenies, with the remainder

from recrultment services for

requirements for computer

taff in the North are similar to

the rest of the country, CPN

eashire told Computer Weekly

that he feels contract staff in

the North place more emphasis

on job security than those

y Computer People has been a major factor in the auccess of

This package is a collection

of benafita for contract ataff amployed by Computer People, including sick pay for up to three months of 75 per cent of the normal pay, bonuses paid in addition to the second of the se

in addition to pay as a form of

hoilday pay, and assistanca

with pensiona and mortgages. This package also assiets

cliants, Lancashire said, be-

cause it provides higher quality and more stable staff.

Dave Eacott, who is ree-ponsible for CPN's recruitment

activities, ballevea there is a gradual "drift homewards".

s why he believes the 'people package" developed

based in London.

general manager Chria Lan-

clients' parmanant staff. Although he believes

target in its first year.

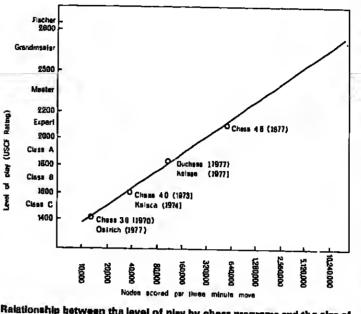
£1m turnover

if we were to extrapolate on

University's Computer Science.

By Donald Michie

Plotting a straight line to Armageddon



uggeat that extrapolation of the Newborn dlagrem will underestimate rates of improvement:

A: Advance of hardware only is assumed: programming and database techniquea are taken as constant over the period - an unreal assumption.

towards the North by some computer staff and that, with

the current severe shortage of

akllied computer personnei.

the "quality of life" is becom-

ing an increasingly intportant factor in contributing to choice

Although VLI has had a pre-sence in Manchester for many

yeara, Computer People North

was firat started as a major

commitment two years ago

when one of the group's direc-

tors, Tony Vickers, moved

North to the company's officea

in Cheadle, above a rallway

model shop. Chris Lancashire joined a

year ago and CPN is now

planning to move into a ground floor suite in an office

block being built in Cheadle,

with three timea the floor

apace of their existing pre-

A aubsidiary was opened in Birmingham last year, and

there are plans to open a Leeda

Chria Lancashire believea it

is vital to have strong local

involvament and local understanding of an area, although he also emphasisea that it is a

great help to be part of a larger

group with London head-

Formerly known as Vinson Lamfield International, the

VLi group of computer ser-

vices companies which include the Computer People and Co-

Operators recruitment and contract staff consultants and SIL systems house, have now had their name formally changed to the VLI Group Ltd.

office soon.

quarters.

of jobs by staff.

trapolations are of limited value. B: Chess programs are just it may, however, be possible to beginning to probe beyond the give the calculated conclusion depth of tactical analysis of some standing as an upper chees-masters. There is a bound. Two Independent factors possibility, and some supporting

indications, that the disorienting effect upon the human player of the increasingly obscure and tricky styles of play which will

A startling commentary on this second effect was provided in Toronto last year by the attempts of international Masters, Hans Berliner and Lawrence Day, to conduct the attacking side of the King-Queen-King-Rook ending

Master of all he stirveys, general manager of is progressing on the new office for the down the new office block

defence. Theoretically, they should have been able to crush the opposition, but they could They spoke of the upusting

effect upon them of their opponents' bizarre daredevil atyle, apparently exposing itself to sudden death, for example, by allowing its King and Rook to become aeparated, and then miraculously surviving.

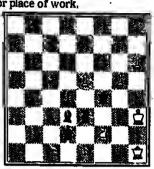
As for effect A (improvements of programming tachnique and of machine representations of chess knowledge) current indi-cations also favour acceleration of advance on the machine aide.

A ploneering contribution by Jean Pitrat of Paris repayastudy. Hla program finds deep tactical combinations of the sort which a Maater might miss. its approach is in stark contrast to the 'state-of-the-art" designs on which Monty Newborn's chart is instead of blindly exploring

the forward paths, the program reasons ita way through the maze, systematically identifying goals (for the program's side) result, may be disproportionate. and obstructions (by the other side), the removal of each of which then constitutes an Intermediate goal en route to its main Below is a position taken from

Du Mont, together with the published solution and analysis. Pltrat's program does even bet-'People package' pays off as CPN

the naxt Chesslab, together with the sender's name and address, or place of work,



Postscript. A snag in the "uptha company's range of comper bound" argument is the possibility of significant puters and business machines. mprovement during the 10-year month, and the 50,000 square period in the atandards of foot facility will have an antihuman championahip play. In cipated employment level of particular, deeper insight into around 200 people. Initially, the game by masters might lowever, the plant will be staffed by engineers transfered machine analyses. if this were to from the two existing happen, there could hardly be a microelectronics facilities, in more pleasing eventuality, nor Colorado Springs, and Miamisone of better augury for extending human intellectual resch in the non-recreational domains of science, medlcine and techno-

A chess combination program which uses plans. J. Pitral. Artificial tutelligoneo 8, pages 275-321, 1977. Computer chess. H. J. Berlinor. Nature, vol 274, pages 745-748. August 24, 1978.

Cyber 175 fcr SIA bureau

MAINFRAME processing power at the SIA bureau is to be enhanced early next year with a CDC Cyber 175 Model 100. The machine will have a 131K 60-bit word main memory and 24 high speed data channels and will be coupled to SiA's existing CDC 6600 to run as a dual system. It will increase the total power of SIA's Cyberpower service by almost 2.4 times, according to

DG adds to

Eclipse family

A MORE powerful mid-rong

commercial system has been added by Data General to its Eclipse family. Called the Eclipse C/350, it slots in above

the existing C/330 and provides

up to one Megabyte of main memory and 1/O data transfer

rates of up to 10 Megabytes par

Data General has ngreed in

orinciple with Nippon Mini-

Computer Corp to take a 50%

share in the Japanese firm in exchange for granting an ex-

clusive licence to Nippon to

manufacture Data General pro-

NCR to set up

A THIRD microelectronics

research, development and

manufacturing plant le being pienned by NCR in the US

To be alted at Fort Collins, Col-

orado, it will be used to design and produce microcircuits for

Building is due to start this

micro plant

duct to Japan.

Midlands access to Infenet

THE California-besed information aciances group, Computer Sciencea Corporation, is to open an office in Birminghain to meat local demand for its services. The office will open in January next year and will offer telephone dial-up access at local call rotes to the infonet time sharing aervice, which la based on Univac 1108 computera in Chicago, Cailfornia and

Help for Flat

A COMPUTERISED financial and management accounting system is now available to Flat lealers throughout the UK from CMG Computer Macagement Group (Middlesex). The system, cailed the Flat Management Iginally developed for the Flat Motor Company in the UK.

Standards oall

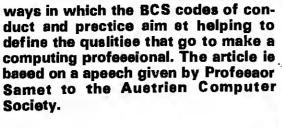
LAWS controlling privacy and international data flows should be standardised internationally. according to the US sarvices organisation Adapso. In its sub-mission to a State Department committee, the association asid it would soon bacome uneconomic to operate international

Gost of the book. The cost control of data processing (CW August 3) the price was given in correctly. This 84-page book cost 83 and is published by the institute of Cost and Management Accountants.

There is a perennial debate in and on detion for a new grading structure for professional panel made a recommen- Professor PAUL SAMET discusses the

the fringee of the computing com- BCS membership which would give munity about whether there is such a recognition to practical as well as thing as a "computing profession" - academic qualifications. Continuing and if there ie, how it can be defined. the discussion on professionalism, the Recently, Roger Grifflths of the BCS following article by BCS president

duct and prectice aim et helping to define the qualities that go to make a computing professional. The article is based on a apeach given by Professor Samet to the Austrien Computer





SAMET . . . "All members of the SCS ere bound by these codes."

How a computing 'profession' can be defined-

In "The Doctor's Dliemma," that ail professions are conapiracies against the laity. As so often with Shaw, the witty phrose has o certain amount of truth but is not alwnys quite right.

There is e well-estoblished tradition for activities involving under controlled conditions, by persons whose competence cen be demonstroted and who can take responsibility for their actiona, by risking their reputation end livelihood if necessary. The greater the riak to the public the stricter the control. This is right and proper.

In law ond medicine, for example, there are strict systems of licensing and registration The pructitioners will normally organise themselves, to set standards and to troin others to work to these, to help the public and, i have to agree with Shaw, on occasions to help themselvas, by restrictions of various kinds. Different professiona have different beliefs and procedures. which sometimes conflict.

The question I wish to consider is the extent to which such considerations are relevant to those of us engeged in com-puting. To do so, I have to consider professiona in generai and their organisation.

Professions, in the sense I intend to use the word, are asaoclated with performing tasks that are specialised, complicated or dangereus and which involve the public, often with some degree of riak. This until 1828, no institution of obviously covers medicine, law, higher learning in London.

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engineering, teeching and although one often talks of, say, "the theatrical profession" it is not cleer to me hew such activitles fall into my definition. So i shell ignore them.

Certainly, ell ectivities that i Include Involve en extended

> It is not possible to Insist on a general rastriction that all computing work be done by profassionals, just es it is not possible to insist that all typing is done by sacre-

period of training leading to a qualification, dedication and some measure of control (by or

£185.00

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The training I have mentioned is often carried out at an institution such as e university or polytechnic, which is also involved in the qualification process. In the United Kingdom things are not quite so simple, standards we set ourselves to because until comparatively achieve and the behaviour we recently (say 1970) universities did not deal with subjects like lechnology. There were also than that, we announce that religious and political restric- those who disregard thase standarda shall not be counted tions end, surprising as it seams, among our members.

Computing is a new activity and appeara to preaent a problem in a discussion on professionalism. Very large numbers of students are now taught how to use computers, from school onwarda, and there is at present no general demand from employers for the posses-sion of computing qualifications for a job in the industry, although such qualifications do exist from universities, polytechnica and tha BCS, for in-

general restriction that all computing work be done by proasionala, just as it is not possibla to insist that all typing is done by aecretaries. There is only ona widely distributed skill everyone who practiaes it lagally

other hand, and the law courts care and attention as the other and especially all professional were concentrated in Lenden, parts. If society insists that the members, are bound by these and hed been for some hundreds other parts are only executed by codes. of years. This led to the esta- or under the direction of appro-Ishment of special institutions priately qualified personnel, as a formalisation of experience for medicine, giving quelifica- perhaps with licencea, the same into a aet of rules. A code is tions, and the erganisation of qualification and control system

are creations of the last century, originally set up to give qualifications and to set up we thus have a wide range of valent standard, without necesarc organised and the cole we

for people with similar interests to come together, to exchange experience, and so on. I believe, however, that what distinguishes a professional society from a self-help club are social responsibility, competence and ethics. These show respectively our care for others, the achieve and the behaviour we Affiliate 16%. expect of each other, especially in dealing with others. More

It is not possible to inaist on a

power stetion under control of a computer system, an intensive care unit in a hospitai, a system with personal information. Tha first threa of thesa can be code of practice. Tha first has dangers to lifa, the last can cause been published already, a draft.

The great hospitals, on the component te have the same All members of the Society.

like the traditional ones. It was in 1968, after considerportant to realise this because with the greding structure come t affects the way societies like a system of examinations and the British Computer Society disciplinary procedures. The Itself a worthwhile exercise. grades themselves are to reflect knowledge, experience end res-It is, of course, guite natural ponsibility. At present they are: Fellow: Member, fully pro-

fessional; Licentiate, technically competent, still- lacks experlence; Associate, not yet fully competent; Student, undergoing training; affiliate, not computing professional.

The distribution of the main grades la roughly: Fellow 8%; Member 50%; Student 16%; This is possibly, indeed, prob-

> There are fears elready thet smell numbers of people operating computer systems cen have mejor effects on large sections of the populetion. A recent British Civil Sarvice study suggests that the government is more vulnereble to ection by hendfuls of computer steff then to whetever the most

powerful

union can do.

everyone who practiaes it lagally needs a licence, driving a car, ond this is because of the potential dangers.

On tha other hand, there are areas where computers are deeply involved and the public has a parfectly proper right to demand the best possible protection. It is easy to give examples: an aircraft with onboard computarised guidance, and landing systems, a nuclear power stetion under control of a computer system an intensities.

As an attempt et tackling the conduction: Involve ween levels and between ability. Contracts. Get expert advice and have a full specification. Sacurity, integrity and privacy. Ascertain and eveluate riaka, recommend appropriate measures and monitor these in practice; train ataff to protect life, deta, equipment (Design). Stay within your competence; have standards, of procedure and between ability. Contracts Get expert advice and have a full specification. Sacurity, integrity and privacy. Ascertain and eveluate riaka, recommend appropriate measures and monitor these in practice; train ataff to protect life, deta, equipment (Design). Stay within your competence; have standards, of procedure and documentotion; livolve when legislation is formulated.

threats to individual privecy. of the second has been published in all auch systams it is end the final stages of aditing important for the computer are now in progress.

must apply to the computer adopted by a community bethe courts led to a teaching, parts. This is why we can and cause its members accept that must consider standards in adherence to these rules, inor lawyers.

Computing and why we, in the cluding the restrictions this BCS, feel it is right to talk of implies, is of benefit to all, inside computing as a profession, just and outside the community alike. A code also has an educational role, by setting out safety standards, for Instance in able discussion and argument, what is required of those wiselectrical engineering. In Britain that the BCS adopted a pro- hing to join the community. It feselonal structure, with dif- may be said that everything ferent membership grades to contained in an acceptable code methods for people to get pro-ferent membership grades to contained in an acceptable code fessional qualifications of equi-reflect differing degrees of com-ls obvious and merely common petence and experience. The sense. This, however, does not sarily having to go to a univer-aity or similar institution. It is continued to this day. Together selection and emphasis of a discussion and argument have lessen its worth. The conscious group of "common sense" items on the basis of experience is by

The code of conduct has five • Integrity. Do not claim com-

petence you do no possess. Discretion. Respect con-

fidential information. Impartiality. Do not claim to be independent when you have a specific interest. Reaponsibility. Do what you

say you will do. Representation. Do not get personal advontage at the are acting on behalf of the

Of course, all arc obvious but there is a need for staff educo- that small numbers of people tion about matters of confidentiality and technical ability, so achievement is not easy. As Hous of the population. For inadults most of us are agoinst sin stance there is a recent British but as children we have to he taught about right and wrong.
The code of practice has to in-

more closely tied to the wny things are done and con be done. To be of value for more than n very short time in on oreo where change is the order of the dny it is necessary to abstract essentials. The code envera seven

 Paraonal requiraments. Bc competent yourself, be aure your staff are troined to be competent, be ready tn

ment. Have objectives, match some, expensive, unnecessary tasks and experience, take and unenforceable. In the view care of communication between levels and between the kind of protection the pu

end documentation: Involve client; have adequate correction and beckup; and above all, ensure technical sound-

implementation. User staff will be ready to take their right training; appropriate ful place as members of the important professions of the proper use of reacuires.

· Live system. Efficient and reliable; monitor perfermance end quality; plan for maintenance and enhance-

At present there is no legislation covering computer work. However, with the spread of legislation concerning privacy. which does affect computer sys-

> To ask thet all computing activity ba regulated is cumbarsoma, axpensive, unnecassary and unanforceable. In the view of tha BCS the kind of protection the public dasiras and to which it is entitled is best provided by licansing and registration of organisations and suitably quelified individuais to perform certain specified

tems, there will be a ilemand for controls. There are fears alreedy operating computar systems can have major effects on large sec-Civil Service study suggesting that the government is mor vulnerable to action by bendfuls of computer staff than to whatever the most powerful

As a creation of the lest 25 years, computing is much more. Internationally minded than; many other activities. It is commnn for people to work in other; countries; they find it easy to communicate with people doing: similar work in "foreign" silroundings.

To ask that oll computing Organisation and menage- activity be regulated is cumberdesires and to which it is entitled;

we have done will be of help when legislation is formulated. The legislation will not enforce membership of the Spelety nor should it do so. On the other hend, members of this Society hend, members of this Society.

MICRO NEWS

COMPUTER WEEKLY, September 7, 1978

Edited by Martin Banks

Motorola to offer Pascal on MACS

view that Pascal could become the dominant high level ian-It is being designed for operaguage of microcomputing, tion with existing memory derevealed that this software will typically sround the 300

As yet, there are no plans for such as Fortran, Coboi or Basic, to be supported on the devica. Modules are currently in deveopment to fit the company's EXORcisor davelopment system, to allow it to be used for software development with the

As an intarmediate upgrade to MACS, Motorola will also be offering Pascai on its existing 6809 processor chip. The langunge is already avaliable for the 6800 famlly from an inde-

pendent source.
MACS, the Motorola Advanced Computer System, is expected to see the light of day early next year, and to show its lineage with the 6800 family, will probably be officially known es

With an estimated 75,000 component alements on the chip, it will be the most complex part yet produced by Motorola or anyone eise. Housed in a 84pin package, to avoid the complication of multiplexing the date and address ilnes, it will

STEM sets up club for mini/micro enthusiasts

WITH ita successful ineugurol meeting aiready behind it, a new computer club is now getting into action in the Meraevoide eres, Known en the Mini/ Micro Computer Club, It is belog run under the guidance of Science and Tachnology Educetion on Merseyside.

Mertelyside.

Menthly maetings of STEM ere currently in the process of being set, and the progremme through to November has elreedy been established. Of September 15. Dr. Malecia. Septamber 15, Dr Malealm September 15, Dr Melec Im Taylor will be giving "an introduction to microprocessors" in the Univarity Solance lecture theatres. The following month, on October 18, there will be emembers' forum to the Univarity Aria reading reom. And on Navember 18, there will be a demonstration on the Nassor 15. demonstration on the Nescom 1 sersonal computer kit.

be obtained frem STEM, 19 Abergramby Squere, PO 60x 147, Liverpool Univariity, Liverpool L68 36X,

Motorola Semicenductor has vicea, with access times be the prime language supported nanoaecond mark and 220 on its new microprocesser, nenoseconda, according to the MACS, due to be unvelled early company, will be more than

The instruction set totals 6i any other high level language, mnemonic instruction types. Thesa, howevar, can be combined with a wide range of ad-The only other software available will be an Assambier. dressing modes in the device to abla will be an Assambier. provide a theoretical instruction set that easily exceeds 1,000 in-

In meny cases, hewever, selection of the addressing mode will be carried out automatically y the device. An example of this te in adding dissimilar operands. through an automatic sign extend function. Oparends of 8-bit, I6-bit and 32-bit can be worked with, through a wide range of bit manipulation functions.

Though still working at the "pepar simulation" stage, Motorole is claiming that the 68000 will be a fast processor. Two million instructions per second is the target operating speed, while the data transfer rate ia being set at 500 Kbytes

Multiprocessing is already being seen by the company as an important potential market for the device, and this has been one of magnitude improvement over of the important criteria in the competitive processors.

ture. It will be a fully synchro-Motorola, wili be able to cope with peripheral and memory devices that are speed iimitad.

For axample, in operations such as mamory accessing, the bus cycla will finish when the memory function has been completed, not when a defined time cycle la completad. This adds the possibility that functions performed by devices that are physically separated by some distance can be accommodated.

Like its predecessor the 6809. the 68000 will operate with posltion independent code

Several davaiopments are aiready in the pot for the davice, including a memory management chip which should be aveilable shortly after the processor, and a hardware floating point version of the device. This is planned to be a derivative of the 68000 incorporating floating point maths on the proceasor

Until it is avallable, a firmware floating point maths routine will be available, but according to the company, its use will not involve any software conversion work onupgroding to the new version.

Simuleted benchmarks of the 68000 have indicated that the device will be offering an order

AN artist's impression of the Shuttle spacecraft, which will be the home of the joint US-European Spaceleb project. Among the early experiments planned is research into the production of electronic materials, such as advanced semiconductor compounds, that could ultimately replace silicon as the basic material of integrated

Solid state research in space FOLLOWING the news that the

Russians hava been carrying eut research into producing emiconductor materials in space (CWI, August 3), tha American National Aeronautics and Space Administration has revealed plans to perform similar work as part of the Spacelab Due to be launched in 1980,

the Spacelab will carry with it a range of moterial processing experlments, some of which will relate to the production of electaking place between NASA and TRW Defence and Spaca Systems Group, which will be sctling as prime contractor in the development of the experimental equipment required for the mis-The long term importance of

Details of the actual experiments have yet to be finalised. but if the efforts of the Ruaslans are any guide, the growing of more complex semiconductor materials, such as indium antinomide, will be high on the list.

The most recent expariments complated by the Russian Cosmonauta in Salyut 6 have in cluded producing semiconduc-tor compounds based on cadmium selenide, gallium arsanide, and indium antinomide.

this work which for the time being, at least, gives the Russlans a theoretical lead in advanced semiconductor research, is that cryatals produced in zero gravity offer aeveral distinct advantages over those grown on



Colleges launch autumn courses on computing

AS the new acadamic session gets undar way, several colicges ore launching autuinn courses on various aspecta of microcomputing and the micro-

logies of current computer natworks to cope with the connection and co-ordination of sys-

Further details of the club cen

At the Polytechnic of Central London, a research course on multi-microprocessor systema is to be held between October 2 and 6. Jointly sponsored by the Poly and the Instituta de Racherche d'Informatique et d'Autometique, the main government institution in computing end automation in Franca, tha course will cover, es a major topic, tha problama of reformulating the methodo-

tams incorporating 100 or more microprocessors. Further informetion can be obtained from Julia Kassell at the Poly, 309 Ragant Street,

Also scheduled are a saries of day release and evening courses, by Merton Technical College, Morden Perk, London Roed, Morden, Surrey, covering a wide

Approximately half the course will be devoted to practical work. It will start on Septembar about the subject from e low level, the college is also running threa evening courses. Thase are: an introduction to Microprocassors, sn Introduction to Microprocessor Software, and a Microprocessor Workshop, The

considerations.

tion of one avening per week, and together provide e basic grounding in the aubject.
The 12 weak workshop will allow atudents to develop systems end softwere, using the college's facilities. Further deranga of aspects in microcom-puting. course organiser, Bill Wittema,

Newbear to unveil 'personal' Panda

A NEW personal computer aystam, known es Panda, has bean introducad by Nawbeer Computing Store. It is to have a lta first public should at the Paragraphic public showing at the Personei Computing World Show later thle month at the West Centra Hotal in London.

Based on e Motorola 6800 chip, the system factures 8 Kbytes of reed/write memory, end 8 Kbytes of EPROM. This normally will hold an advanced

Basic interpreter.

A full Ascil keyboard is provided for date entry, and than system also incorporates a nine

Inch display capable of showing
Is lines of 64 characters each.

A prototype of Penda was first

A prototype of Penda was first

Microsystema 78, and elthough the system can elso be used es a the production version is ramote terminal to another alightly lerger, et 12 Inches wide computer system.

x. 20 Inchas deep x 11 Inches In eddition to the normal inches in eddition to the normal facilities of an 8K Banc, Pende's

A prototype of Penda was first interfece is programmeble be aeen et Newbear's stand at tween 110 and 1,200 band, and

alightly lerger, et 12 Inches wide
x 20 Inchas deep x 11 Inches
high, it is still one of the smallest
systems currently available.
Interfeces for audio cassette,
end serial RS 232C/V24 are
available for the system's 80,
way bus structure, together with
e TTL compatible parallel active. Error meesages in the
input/output board based on anguage include, doverage of
Motorola's peripheral interface incorrect like numbering.

COMPUTER WEEKLY: September 7, 1978

IBM reorganises as prelude to two new series

H series models (CW, Aguat 31) and also, some observers be the break-up of the IBM into sutonomous divisiona or even Independent companies.

In env event, the changes are more than merely for administrative convenience, and sre strong Indicators of IBM'e likely

One of the most detailed analyses of the nature and meaning of the changes has been prapared by the Technical Analysis Group of New York consuitants Advanced Computer Techniquee. The study is entitled IBM Systems in the 80s*. A key aspect of the new IBM

organication structure, sccording to the ACT study, is the dividing of the Systema Product Division into two separate divisions, one still called Systems Product Division reaponsible for all current and future intermediate-scaloprocessors including the E series and ralated software/microcode; and the othar called Data Sye-

Endicoll Lnh

DDS SE Systams

Man**e**der

Processor

A FOUR ilne asynchronous and

a single line synchronous con-

single multiplexer board by Data

The ULM-5 universal line multiplexer is a 15 inch square

printed circuit board that

occupies a single slot in a Data

General Nova or Eclipse chessis.

It is coftwore compatible with Data General's ALM and SLM

series multiplexera and is sup-

line ayrichronolia control-

CASHnCARRY

Dumb Terminal

for just

£545

why pay more t

ported by their operating sys-

advance

President SPD

(Intermediate Size Processors

Development & Mfg

European

DG multiplexer Moss system spearheads

Managemani Developmeni

Processors Liaison

Future of the 370 -

pro "likely to be short-lived" be-cause new maphines from ISM will use erchitecturee very dif-ferent from those of the 390, 370 and 393X sories computers, according to industry Measures, published by the Technical Ans-lysis Group. Without a new architecture,

ACT does not believe IBM could maintain a 13 to 14% growth rele during the next decade.

Industry Measures says that the 370 will cantinue to be two years. Mast of the PCM companies have systems in the field end will do well during thet period. Dne possible exception is Control Data, which is lete with

tems Division, which has a similer function for large processors, including the expected H series.

Bob Fertig, heed of the ACT
Technicei Analysis Oroup, has developed with his collaagues what is believed to be an accurate organisationel chart for the new SPD and DSD etructures,

ture of the 370 sories. Rizzo, an IBM senior vicepresident and head of the Deta Processing Product Group (see

delivery of its Drags line. So, for the short term, the PCMs will enjoy brick sales, greater, ascor-

ding to ACT, then the combined seles of all incompetible moin-

frames.
The test of the PCM's will come

with the first shipmants of E

end H-saries processors. Some edd-on and processor mekers will

be able to keep up, after o year or more of development effort, but othern will be left by the weyside.

Users who awn plug-compatible equipment should

have no trouble realeving con-tinued support and, if price com-

petitien continues, they may well stay with the obsolets but in-

orsasingly economical architec-

T. C. Papes, who headed the previous SPD unit, was recently moved to an administrative position as vice-president of 'businesa plans". Fertig believes which both report to Peui J. hewssmovedbecause it was feit

Magulacturing | Information

Director

Brooklyn

Doncaster and York, and in-

crease journey times uneccept-

Developed in co-operation

with the Northampton and West

Sussex local suthorities, Moss

ensbles 3D highway models to

be displayed on a graphics ter-minel and for this Durham uses

a Tektronix 4414 terminal linked

to a l Mbyte IBM 370/138 which runs VM/CMS. It has been in

It is also Fertig's view that softwere and herdware development groups have been joined under the new organisetional plen so that shifte in systems functions may be more easily

Both SPD and DSD include their own processor, programming and systems software (including microcode) capability Indicating, Fertig suggests, greater interlocking of hard-ware, firmware and software functions in future products. ACT claims there is a distinct

fference between groups working on the low-end mainframee - the Imminent entry-level E series, and the high powered H series, expected to be an-

*18M Systems in the \$0s costs about \$5,000 for the full report but excerpts are available for less. For further information centact Robert Fertig, Technical Analysis Group, Advanced Computer Techniquea, 437 Madison Avenue, Naw ayerk, NY, 10022, USA.

Director

Pouchkeensid

Lab Manager

MVS SE &VM

Processor

(Large Scale System

Large Systems

Manulacturing

Valley Kingston NY

MId Hudson

Director

Product

Mauagemen!

£100m floppy

FLOPPY disc drivee valued at

about £100 million have been

ordered from BASF UK by

lesearch Machines, the Oxford-

based microcomputer manufac-

The drives are for Research

discs order

Paul J Rizzo IBM Senior VP & DPPG Group Exec

Fishkill

£35m railway line diversion



Weather satellite images

LIVE soteliste images of the weather over the North Atlantic nd Europe ore being disployed ot the Fornborough International Exhibition this week by this system developed in the UK by the Dotn Systems Group of Greaturn Lion Ltd.

received by n three metre dish seriol on the roof of the Depart-ment of Industry stand at Forn-

med to store on n fixed head

fechines' 380Z, Zliog Z80-based The order covers both standard and minifloppy drives. Nick Hollis, of BASF UK, sald that the order was the largest

anoshrome images and dis-

The system of Fernberough is madification of a Greshom Image processing product circady used in bady scannars and for military opplications.

on display

The digital images are from the European Space Agency's Meteosot sololite and are being

borough.

The Gresham system in-cludes a Digitol Equipment PDP-11/04 which is program-

med to store on n fixed nead died drive ell the 8-bit elements, ar pixels, that make up each image. The computer onn then display the complete image on the systam's TV manitar or many at a systicular section m on to a particular section of the image by electing and displaying all the pixels that make up that section.

Another important facility provided by the eoftwore on the PDP-11/04 is adding false calour to the monochroma image received from the entellite. The colour assigned colour assigned to any segment depends on the intensity of the shade of grey.

The system can olso store up taken since the UK operation took over marketing of OEM

On its own the four line Council lettings automated A COMPUTER-BASED eystem cost about £100,000, will help in Takeover

asynchronous controller comes as the model 4241 at £896, the samo price as model 4242, the ler, on its own Together as the ULM-5 model 4243 it coste

370/138 the system, expected to

for handling the letting of coun-cil housss is to be set up by the processing of spp formation and the sul formation and the sultability of avaliable accommodation. It will Beeed on the council's IBM also be linked to the present rent

Director

The ACT vorsion of the new IBM organisational chort for its Systems Product Division and Data Systems Division

A COMPUTER-BASED high-way design called Mosa (MOdel-ling SyStem) is to be used by

Durham County Council to assist British Rell in its plans to

divert pert of the London to

Newcastle rallway line to svoid

National Coal Board works at

If the £35 million scheme were

not carried out British R sil says

that ite 125mph trains would

"When It is introduced, the new system will make a vast amount of difference," said a

Business show

The first screen word processor from BDP of Isleworth, which has hitherto dealt solely in hardcopy mechines, will be one of the items on show at the London Business Equipment Exhibition from October 24 to 27. Organisad by BETA, the show will be held at the Cunard Hotel

Wang Laboratories of Lowell. Messachueetts, has agreed in principle to buy Graphic Sya-

products in this country.

WORD processor manufacturer

tems, a maker of phototypeset-ting systems, for \$1.9 million. whola letting procedure will be faster and more efficient."

council epokesman. "The old manual system involved a lot of 2960 running under VME/K

A PROGRESSIVE switch from a in Northampton in n year's time.

1903A and a 1903T running and the second will follow one under George 2 to a dual 2980 running under VME/K is planned by Hunsbury Computer
Services, the bureau offshoot of
Blackwood Hodge.
The first 2960, with ona
Megabyte of memory and 800
Megabytes on disc will be installed at a new computer centre

Installed, the DME operating system will be used to support the 50-depot Blackwood Hodge communications system during the prima shift, and during the other two shifts, programs will be enverted to run under VME/K.

NEWS IN BRIEF

Arbat opens Kent centre

SYSTEMS house Arbat, white specialises in banking applicaions on PDP-11 minicomputers has opened a research centre i Ashford, Kent.

The centre is equipped with a Digital Equipment PDP-11/70 minicomputer, and will be headed by new R&D director Peter Facey. He has been a consult out to Arbut since 1972, and developed the AIMS operating system and programming in Dong Schilling.

Water board link-up

A COMPUTER system to monttor and control water supply, sewinge frontinent and river munigement is to be installed by the Wussex Water Authority. Suppliers of the equipment will las Serck Controls of Leamington Spir and, whon fully operational, the systam will pro-vide un interlinked control sid data collection eyslem covering 70 outstations in three districts.

Yindicated

STANDBY arrangements for an online database system in Edit burgh were vindicated when work was successfully transfer-red for a day to an IBM 370/158. The implementation in thought to have been the first such operation in Europe was purified out under an agreement ried out under an agreement ande leet year between Scient tho Scottleh Widow Fund in Life Assurance Society in the 370/145 was down to software with the sof

Retrieval

A MEETING on the use of intelligent terminals in information ligent terminals in information retrieval is to be held at the City retrieval is to be held by he on. It has been of ganised by he on. It has been of ganised by he on. It has been of ganised by held by held in the city of mation Retrieval Speaker from include David Bagley philip Hatfield Polytechnic and a

How micros will change the face of computer design

"I CAN'T find any commoditiee on this planet that simultaneously give better performance, less cost of ownership, consume less power, or that are more reliable." Speaking at Hewlett-Packard's semiconductor production facility in Cupertino, California, Lerry Lopp, engineering manager of the company's sillcon on sapphire programme, could be talking about the latest offering to roll off General Motors' production line, but is in fact describing how he sees the ubiquitous microprocessor.

Up to 20,000 Integrated circuits a month of various kinds are produced at the facility and it is the axle around which much f the company revolves, as

Ve are essentially a supplier of CMOS and SOS components to other Hewlett-Packnrd divisions," he said. "And what we are doing with this technology is replacing the way we design and build computers. In the past we have thought about Integrated circuits as an element in the hardware, but we are at the stage now where the integrated circuit ia tha hardware.

"By 1985/90, somewhere In that time-frame, that's how you are going to make computers. There may be printed circuit hourds and there will still be sheet metal around the box, but the electronic functions will be done by integrated circuits -

On the semantic Issue of what to call such computers, Lopp has this to say:
"With LSI and VLSI techno-

logy, we are very close to the int where it is actually possible to create a real computer on a single chip. Whether we call them mainframes, minicomputers or micros doesn't matter — that's a marketplace issue.

"Microprocessors have been defined as the sort of thing you find three to four of Inside model aeroplanes. TV games, automobiles, or medical instru-

"The delinition we use here at Hewlett-Packard is very dilferent because it is not very dependent on the hardware base. It is dependent instead on the application of the product rather than how to create it. So in our context, a computer is the thing that does the set of tasks we have decided to provide for our customers, whether it is a inicro or a minicomputer."

Giving an explanation of why integrated circuit technology is superb at assuming new guises. Lopp said, "A statement I would make with a very high degree of assurance is that as fast as we design something, the Insides are going to be made with LSI and VLSI chips. There is general Cupertino lab. agreement on this here in Silicon Valley. It is an applications area;

the LSI technology applied to computers is more than we need at the moment and it can be forced to evolve faster than we can figure out how to use it, How many gatee would you like an a chip? ... How fast would

you like the gates to be?" Nine different circulta are currently produced by HP, six of which are the company's Micro Computer Chip (known as MC-) family designed specially for control applications. About 20 other designs are in progress and aithough none of them is currently intended for sale outside HP, it has not ruled out the possibility of offering SOS this. circuits to other companies.

Lopp describes the state of circuita are created at the moper chip. "In production we are at 25,000 devices easily on a chip." he said. "and in development, which tends to be two to circuita are created at the nio
circuita are created at the nio
ment, it is a drafting job of ectivitiee have been to under
limmense dimensions and in stand and control the relation credible boredom. To make a ships of different boxes and provide a reaconable language.

three years out, we are at four to half a million rectangles and six times that. We are also working on concepts that will utilise fact, it's the kind of jobyou look several millon devices in a ut and immediately convince circult. The available com- yourself that the computer is n plexity is very impressive, howwhole lot more capable of doing it than we are. They don't tire or "For example, take one of our get bored, it's the class of job minicomputers and separate it you can delegate to the com-

into the intelligent portion, the puter and then use the human memory portion, and the stuff for what he is good at - the that is stored in the I/O portion more creative and innovative - we can put sny one of these three functions on to a chip and in many cases end up with more capability than is required."

for the designer is an environment where it is a creative and "What we are trying to create capability than is required." This ability leads to some inintellectual challenge to design teresting conclusions.

"So what we cen talk about," drudgery. said Lopp, "is adding value in the future life of the product. I don't loading work on to the comknow how we are going to do it, puters, ns Lopp is well aware.

Finding out the pro-

Lopp beliaves thet with

enginearing

As films ere linked with ranging from elactronic Hollywood, so semicon- teat equipment to meinductors ere immediately frame computers. idantified with Silicon Veiley, where one of the cast blams of producing these of stars is Hewlett- micro ilgsaw puzzies, Packard. ROBIN WEBSTER went to

Sited on Stenford in- Silicon Vallay to see Lerry duatrial Park lend, HP's Lopp, semiconductor fecliity maneger of Hewlettuses ite 30,000 sq ft of Packard's SOS proclean rooma to develop gramme. end menufecture SOS allicon on sapphire, end microprocessor techno-CMOS, complementery logy, the changing face of metal oxide silicon, computer design will

circuita for products change even fester. but simplistically, you can say ict's sell a guy three computers

on a chip and he gets to use whichever one of them works. Or we can teach the three how to argue uniong themselves unil give him the answer that two This is all quite feasible; it is coming. There is no reason why excess circult capability can't be

used to improve the life of the In an attempt to improve the design of its products, HP hns relegated much of the recording and processing of design information to computers - about 30 of them in the 50,000 sq ft of the

'If you look inside the lab here you see that we are using computers to manufacture themselves," said Lopp "It's the only conclusion you can come to. More and more each day we ere training these things to bulld

"Computers keep track of the production process and document it for us. There is so much the educational system," said. data. The time-lag between Lopp, "If you have s lot of thaoretical davices and the children who don't receive. practical production of them I think is pertially because of the time it takes to achieve the required manufacturing control.
The lag seeme to be gatting has to trein it and that essen longer in some cases, and one of the major applications of our trains and focuses the power of computers is to try and correct the hardware."

"If you look at how integrated giving its own hardware?"

"We are now taking the steps that put the computer in us nn active participant in the manufacturing process," he said. "I don't see it as u large technical challenge to be able to do this, but it's a pretty importunt social issue on whether our labour force is going to feel good nbout this computer telling them what to do. I think you inve to move slowly in these

To make full use of integrated circult hardware, It is esaantial to match it with good software. which has its own price to pay.

"The real value of the micro is the technical ability it sllowa, out it takes an understanding of that to customise it to particular applications - and that understanding typically comes from software compenies, people who know how to use it. So the micro costs you a buck-and-a-half, but it costa you \$3 million to get Into he business of applying these

things.
"You can do an analogy with tislly is what software does;

What aort of training is HP

to instruct the maachine. That's where we have been historically. 'However, I quickly found hat all the internal stuff had been relegated to LSI chips, and so if you wented to connect this box with that one you just put an LSI chip in there. That's the end of that: you don't have to do en integrated circuit, not any programming because it is dready taken care of for you.

age capability for the customer

"Our activity has moved up a level now, and we are mnking the language more appropriate

a 'friendlier interface' is a

term we use n lot. We are also starting to do much heavier applications work specialising collections of hardware to parti-

"It's tough to do that. For example, take a linsiness computer and present it to a company and say this is your accounting system, your working process, your inventory munugement system. They may not agree with the set of choices we have made. So in the applications area you ure getting into the inside workings of a com-pany, and it's risky. They may choose to do the job differently from your way of thinking."

Lopp did feel, however, that Hewlett-Packard was in a good position to reap the benefits of all the expensive development work that has gone before.

"I think we are at a point now which is ruther unique in HP's evolution," he said. "We have spent ten yeurs trying to figure out what technology we next, how to manage it, how to apply it, how to make a buck. It's the gaine wa play, and we might as of rules. We have spent n lot of money doing that, a lot of time. think wa have a solid evolving senae of how to integrate these things into a business. So we are sort of coming out of the acquisition and ragaarch and development phase in HP and moving into the exploitation the business exploitation of the

Part of this exploitation undoubtedly rests on educating itles, showing what it can do for them. But Lopp felt that there was still s barrier here that had to be overcome.

"There is, I think, a fairly unique thing in computers, because they are so magic, they have a gee-whizz aura. They put paople off; you see it all the time. The typical layman is afraid of the technology, and that's a bed situation to be in.

"I don't care if nobody knows how the computer works tha question is: Is it performing the question is. Is it performing the function we relegated to it in an efficient, caring way? You've got to get paople up to the point where they can understand the application of the technology not necessarily how the thing works!

It your design, yriden husavee

TODIO WALLINGE loading supplier, and it's not from Inforex.

well... Think again! About cost effectivenaes: from inforex you can get a complete three key-station system for under £10,000. Think delivery again: you could do away with punched cards by the end of the month; Think egain about service! a reliable, wall proven ranga backed by a national earvice taam. Any way you think about it, inforex offers the beat available solution. The world's leading supplier, with over 4,500 eystems worldwide, will take you from punched cards to ay-to-disc (expandabla to meet your most exacting raquirementa), to data management and lo distributed processing with a compatible product range and tha support to make it happen. Telephone inforex at 01-863 831 i. or sand the coupon for full details to: Inforex Limited INFORMX Inforex House Headstone Road, Data Management Systems

thinkagaint

Penny & Giles Data Recorders Limited

dipoletoral Chinachers to Decad Blogs 4A1. Suphone High-hiller (style) of the Challes of the TALMER REPORTS FROM INDIA

In the past three years, computer services companias have sprung up all over India. Most have already forgad links with US mainframe or motics in 8ambay, as yet have no foreign associations.

minicomputer manufacturers, but three of the tions. Tim Palmar continues his Indian report. Services companies look for links with the Western world

services companies hoping to do business with their counterparts in Europe are several which as yet have no formal line and the service at the companies hoping to do computer in Madraa, and offars on programming, conversion and data preparation work for foreign clients, and is particularly interested in ioint vantures.

yet have no formal links with any US or European organisation, East or West. Shaw Wallace Computar Sar-

CMC Reality

CPU, run two or three times as quickly.

Royale treatment

PERFORMANCE of REALITY, CMC's mini-computer

just been considerably improved in six major areas: so Process scheduler

several functions from core to micro-processor chips (the tirmware). Here, local high-speed

memories work much faster so many DATA/BASIC programs, whose speed is determined by

Terminal input/output is faster because of improvements to routines moving data to and trom

Use of disk space is now more efficient. One innovation is the use of a special firmware

Expanded main core is now available to 128K. Addition of main memory is, among other things.

MA

REALITY ROYALE's new process scheduler allows users to ensure maximum

machine most. 'Problem' programs can be picked out quickly and CPU and disk my attention mora information

And as always with CMC system improvements, existing REALITY Reality Royal

performance where it's needed most - big batch jobs can be prevented from slowing

down inter-active work (data access, data entry, etc.) by giving them lower priority.

New performance monitoring features show users which processes use the

ustorners can easily have their equipment upgraded to REALITY

In October REALITY ROYALE manufacture begins at CMC's Hemel

Hempstead tactory which is also being expanded to cope with

demand for SOVEREIGN, CMC's recently announced data entry

based business management information system, has

significantly we've renamed the product REALITY

Calculation speed has been improved by moving

terminals: and buffer size has been increased, too.

technique to locate data in core without a large search.

an inexpensive way of expanding the number of 'responsive' terminals.

gets the

ROYALEI

Shaw Wallace plans to replace Shaw Wallace Computer Sarvices in Msdras is one of the Anglo-Indian Shaw Wallaca and Angio-Indian Shaw Wallaca and Company, itself a member of the Sime Darby group, it runa s aar-

foreign clients, and la particu-larly interested in joint vantures In the Persion Gulf, where it plana to opan a service bureau.

On the data preparation front the company guarantees a turnround time of 12 days including transit tima, pointing out that Madras has good intercontinen-

of air freight.

Bigger! Quicker! Expanded!

Caiculation speed

Disk space

Main core

Terminal input/output

Performance monitoring

Ita most Important overseaa contract to data regulraa It to davelop and install a dota collection aystem involving some the Intarnational oirport at 25 Datapoint processors for Sima Dorby plantations in

Malaysia. Data will be collacted grammer with five to 10 years' tion, validation and encoding on offline, but ultimately it is into magnetic tape of data are 50 tended that all the processora in to 70 per cent of those in the US and Europe, including the coat the field will be linked to a mainframe planned for installation at head office. Projections Indicate a major improvement in profitability as a result of fraeing

> Across the country in Bombay, one of the most ebuillent and confident figures on the Indian data processing scene is Lalit Kanodia, founder and haad of Datametics. Kanodia worked as a consultant to both Ford and Arthur D. Little, worked on Project MAC aa the Massachusetts Institute of Technology, and founded Tata Conaultancy Services, India's premier computer services company, bafore leaving to set up Datamatics.

managera from time-conauming

Problema simply do not axist for Lalit Kanodla. "I can give you a decision on behalf of Datamatics in 46 seconds," he says, in between reeling off sialistics about his country.
"Groam Notional Product is \$70,000 million; wa have the third largest technical manpower and the largest number of unemployed graduates in the world. We also have the cheap-

Datamatics employs 150 people, 40 of them computer professionals. It has three IBM 1401a in-house and, like everybody else, buya time on most of the third generation machines

"Our turnover is \$1 inillion, but the equivalent work value in Europe would be \$5 million. Our business is 100 per cant computers, and 1978 is the year we ntend to go international." Datamatics is currently in

consultation with four US com-

panies about taking on tho indian distributorahip for their Kanodia declined to name tha

companies but thay are undar-atood to be Prime, Modcomp, Harris and Wang.

"Our future plans include putting in two or three one Megabyte minis of our own, and we are aeeking accass to large third and fourth generation machinaa for software devalop-

Kanodla is also looking for high-volume data preparation work. "We are thinking in terms power distribution and shipping systams, and has also worked in Tanzania, Kenya, Egypt, Nigeria and Ethiopia, as well as working of jobs involving five million cards. We would guarantae 99,9 acy, and provide a one to two month turnround. In the US, the charge is 20 cants per 80-column card record punched and varified. In Talwan, it costs 10 cents. We can do it for 4 cents Its business splits three ways between computer consultancy and aystem davelopment, non-computer consultancy and perconsultancy and perconsultancy and perconsultancy and perconsultancy and perconsultance. a card," ha saya. "Conversion" and data preparation ara easy and savings are 80 par cent. Onsita work is hardar, but using Indian peraonnel would still

In the last area, it quotes rates of \$10 an hour for programmers, \$15 an hour for analysts, \$18 an hour for analyst and \$26 hour for a sanlor analyst and \$26. aave 50 per cent of tha cost." The business Datamatles is, aaeking ovarsaaa includa thasupply of trained manpowar for periods of three months to a collaboration on join projects; costs and ara based on a 140convarsion; and data prepara hour month, although Ferguson,
ion,
"In India we would charge \$50. 180 hours of work a month out;
ir man-day for a senior proyaar; contract programming; collaboration on join projects; convarsion; and data prepara-

Medica. Mualims remove their shoes before entering a mosque, but the practice at Shaw Wollook does not maen that the computer room has been consecrated a holy of holies. It is simply a further measure to ensure that the atmosphere remains clean and dust-free. experience; in the US we would

> "Half our people have worked abroad and we have taken 60 per cent of the new services contracts in Bombay, and we have only lost one client in three years. We handle the accounts for Thomas Cook and Diners Club in India, and sorted out the problems of the State Bank of ndia on its IBM 1401." That, it tranapires, was before Datamatics came into being; but Datamatics and Lalit Kanodia appear to be synonymous and Intarchangeable. After the enthusiaam of Data-

charge \$100 a day plus travelling

A mainframe computer is a valueble place of herdware in eny country, but no more so than in India. The picture shows a shoeloss Tim Palmar making friends with the Indian-built ICL 1801A computer at Shew Watlace in

matics, the conservatism of A. V. Thomas, offshoot of an old plantation company in Madras, s sobering. A. V. Thomas runs a data centre on IBM 1401 and 300/30 mnchines, has 35 technically quolified people, claims 25 per cent of the Madrns computer services market, und processes local college exumination results on the computer, so claiming a head start in identifying people suitable for recruit-

The company is keen to arrange a partnership with a computer (preferably mainframe) manufacturer, and is bldding for major government con-trocts on the basis of used IBM 370s — slinply to gain experlence of tendering procadures. It would like a long-term partnership extending beyond ludia, and is interested in providing marketing support in other Third World countries.

A. V. Thomas has made a

clenr-sighted approisal of the

hurdles to be overcome if it is to

succeed, and recognises that

rendy-made thlent for the kind

of foreign work it would like to

do aimply is not uvailable in In-

din, which is why it sees a close

Longer in the computer busi-

ness than most, Ferguson

Management Consultants has

offices in Delhi, Madras, Bom-

bay and Colcutta. Tha company

has 68 professional consultants.

not all of tham diractly

associated with computer-based

The company claims ax-

perience in India on water and

sawerage, urban davalopment,

as a sub-contractor on ateel

works and banking applications

applications.

collaboration with a major

foreign company as essantial.

In fact any review of the history of data storage will of necessity be brief and cover a relatively short life span. The roots of data storage lie in mag-netic tape, the high-apced alternativa to punched cards. Contrary to what most people expected, and indeed forecast. magnetic tape has weathered

important to human develop-

ment as all the inventions and

innovations introduced during

the first 150 years of the indust-

rial revolution, the computer

has literally revolutionised our

society. The Impact on our en-

tire civilisation, and on business,

government and the political

processes in particular, ts stng-

gering. The driving force behind these

teclinological miracles was the

need for data storage advances.

By significantly cutting the cost

of putling data online, these

technologies have helpad to

move the computer directly into

the spectrum of our everyday lives. It hos been a truly

review of the Impact which data

storage advancas have had on

the data processing industry is

astonishing advance

the ideal aequentlal access device, tapa's capacity has increased from 200 bits per inch to 6,250 bits per inch, and it ta the most cost-effective storage

MAGNETIC STORAGE MEDIA

Cutting the

costs and

increasing

There ore, however, some dissdvantages to using tape. Because the tape stores information sequentially, the user must collect information in butches before it can be put on tape. Batching and aearching with tape is very time-consuming for some opplications. These disadvantages pro-

vided the impetus for the next entry in the stornge lilerarchy. namely, disc. With thise duta storage, the user can directly access a porticular dala record. Disc data storage, introduced in 1956, offered five Megnbytcs

Before elaborating on current spectscular technology, a brief of storage, 100 bits/inch, and a data rate of 10 kilobytes/second. Disc stornge needed to keep pace with the developments in the computer, spurred by the advent of semiconductors which increasad storage demands. Storage requirements continued to surge with the introduction of IBM's operating system, making multiprogramning and multiprocessing possible.

As technological advances in three decades in a rapidly more atorage, technological adcomputers created tha need for

the speed vances in storage made greater capacity available. Increased disc density and capacity per spindle offered customers reduced costs per Megabyte of online data, and in fact a reduction by a factor of two-thirds was made in four years. Since 1070, just prior to STC'S entering the disc market, the price

of disc storage per Mcgabyte has again been reduced by twothirds. Continued improvements in data rate, together with reduction in access motion time and rutational delay, and improved relinbilly linve made computer systems practical for Not insignificantly, techno-

logical advances in the highspeed access products have also reduced costs. Four kilobytes of add-on memory were priced at £300,000 in 1980. Toduy, the price for a Megabyte of memory ns been reduced by more than a factor of 10. The developments memory have coincided with on increased need for storage and n complementary reduction

It is a widely uccepted belief that the storage hierarchies will not change substantiolly in the next decode. To date no single storage technology hoa been diacovered that meets oll the

The world of megnetic storage medie is characterised by steadily failing costs per bit in most established technologies, such as semiconductor, main memory and rotating mamories, and also by the development of interesting new methods of storing deta. Some of these new devices, for example charge coupled devices, are now being incorporated in commercial products, while electron beams and lasers show promise in the longer term for reading end writing dete.

COMPUTER WEEKLY, September 7, 1978

This spacial section on storage media includes en article by Vernon Bluhm, manager of amorphous devices at Burroughs, in which he describes an Interesting new semiconductor technology called ovonic memory. This is e completely non-volatila devica that employs amorphoua semiconductor meterial. John Moore, manager of European operations for Naahua Computer Products, discusses the continuing development of the floppy disc; and in this first article, Colin Medeley, north European asies director of Storage Technology, looks at the hiererchy of storage products that ranges from expansiva fast access main memory to high capscity disc and tepe storage with vary low costs per bit.

By Colin Madeley

data sharing, and at the same time presents a reasonable coat for storing data, comparable to tape. The real challenge facing today's manufacturer is to offer storage products that provide

We also anticipate an increase in the number of storage levels, within the next five years, to fill the gaps that now exist in the price/performance spectrum. Building upon the current storage hierarchy consisting of memory, disc and tupe, future liardware will possess at least five levels, Figure 1.

One new level, secondary storage, will fit between main memory and disc in relationship to cost and performance Typical applications for this storage level include external poge atorage, systems, catalogues and work area. We expect the need for secondory slorage will continue to grow dromatically as the usc of virinal storage becomes more common.

The second new storage level we see developing is archival or automated mass storage. This level is one which will fit between disc and tape in the cost/ performance apectrum. Early attempts at this leval can be seen in the IBM 3650 and the CDC

However, until now, products for this level have achieved nelther wide user acceptance nor a consensus on architecture or format. We believe that over the next five to 10 years improved products will be avoilable and this level will grow in

The migration of the supervisory function away from the CPU will be yet annther significunt architectural trend. Until now, all control functions relative to the physical location of dulu — Its logical organisation, its cataloguing and necessing - have been under the control of the operating system and the user.

Part of this function will be moved out to the storage subsystem. The data will be called for by name, and the subsystem will have to locate and format it for the required application.

Together with the migration of the supervisory function away from the CPU, the virtual devica concept will be introduced. Using it, the user will no longer have to concern himself with customiaing such things as data organisation or occeas method for new paripheral da-

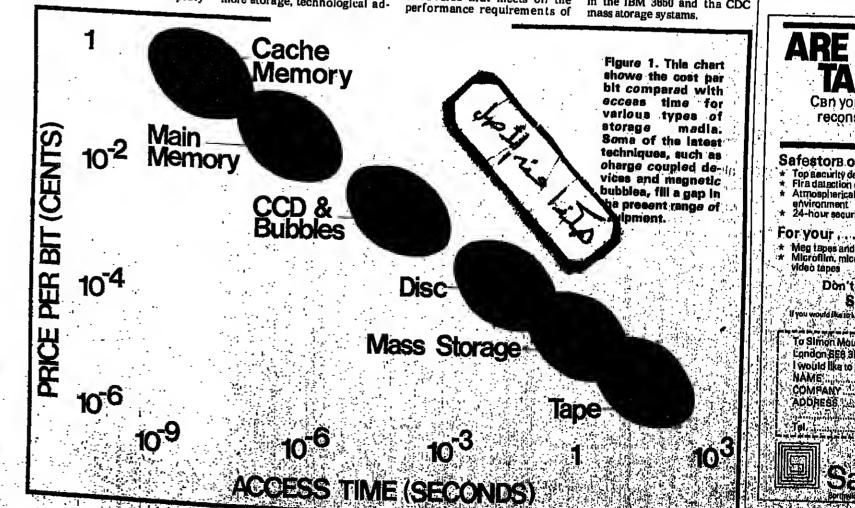
vices. The subsystem will have the power to handle these functions and by doing so, will boost the processing power of the sys-In the technology area, we

maintain that existing technology, namely semiconductors and magnetic recording on both disc and tape, will remain the dominant storage technologies for the next 10 years. Storage will slowly tend to inlgrate toward solid state devices as the price of incmory is reduced relative to other technologies.

However, considerable time and money will be spent on refining densitles, speed, cost and reliability in disc and tape. For example, in five years we expect to see developments in the high performance disc area that include access time of less than 20 milliseconds, and costs of opproximately one-half of

today's prices. We also expect on emphasis in the low performance/low cost disc area. With Increased capacity reaching several billion bytes per spindlo, these diac aubayatems will have slower

Turn to page 18



ARE YOUR BACK-UP TAPES SECURE?

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SafestoreLimited

The growing capacity of floppies

By John Moore

or floppy disc, are some of the more common names for the medium used as the low-cast answer to tha need for randsm access storage for minicomputers and word processors.

The flexible disc is a circular plece of flexible polyaster film such as Myler, eight Inches in diameter, coated on both sides with a magnetic iron oxide resembling the coating for magnetic tape. The whola is ancased ln a plastic or paper outer jacket. vhich hos an inner linar to protect the flexible disc against damage and to act as a surface

access for the read/write hesds, which unlike thosa for larger non-flaxible disc devices, contact tha flaxible disc aurface, uaually with a pressure of about i5 grams. A circular cut-out in tha centra allows tha flexibla lisc to be rotated at 360 rpm , and further cut-outs allow indaxing

are inserted in the drive as a unit, and the disc rototes within The flexible disc medium was

software for iBM'a large disc storage and computer control mamoriss in its System 370 computer family. Later, at lesst two other compsnies introduced

purposes. Then in 1972 IBM introduced its snswer to the key-to-disc dots preparation systems attacking its punched card msrket. This, the 3740 family of data antry equipment, rapidly exponded in capsbilities and the lexible disc market begsn in

Since then the flexible disc has become a popular data storage medium and many companies havs developed and marketed systems around it. in 1973 s further significant increase in its potential occurred when Vydec ecame the first msnufacturer to use flexible discs in its word procsssing aystem. Word proceasing systsms hava incraasingly incorporated these The jacket and flexibla disc devices, widening the market for the flexible discs still further.

As with any new technology, tha demand has risen for increased capacity. Originally

NASHUA

Magnetic Storage Media

serving the world's computers

on both sides, only used one side for storing data, the index hole being offset to ensure that the envelope could only be inserted one way. By making another offset index hole on the other side, the flexible disc could be used on both sides, thus dou-

physically removing and turning the disc by hand, so the next logicsi devalopment was the drive with dual read/write heads, allowing both sides to be accessed almultaneously; this system is becoming increasingly

The next development in the search for increased capacity was to double the packing density (bits per inch), by more securate manufacturing tachniques. The first fishible disc with significantly increased capacity was IBM's System 34, introduced to the markstplace in De-

in summary, therefore, flaxlble discs can be single-sidad and single-density; double-sided and single-density; single-sided and double-density; and double-

All this becomes more betor types are taken into account. Sectoring of flexible dlacs can be either "soft" or "hard." Soft sectoring uses only a aingle index hole on the disc, which signals the start of the track on each revolution. Software locatea the actual sectors.

uss of a circle of holes (the number corresponding to the numbar of sectors required), ususly near the centre of the disc, but on some types near the outsr edge. it seems unfortunate that

drivs manufacturers have produced so many different types of drive, requiring different typea of flexible disc, so that thera is currently some confusion in the market as to which drive Because of the variations

mentionad above, and soma purchaser to know exactly which type of flaxible disc he regulres, and to buy from a supplier where ha can obtain sound The development of the flex-

ible dlac has not been without problems. Because of its magnetic tape-type technology, with the read/writa heads in contact with the disc surface, wear was at first a problem. A change from stainless stael to ceramic ferrite heads, together with changes In the disc surface coating, has givan flexible discs a much more

when double-sided flexible disc drivea were introduced, all manufacturers experienced States, original market forecasts predicted that up to 8,000 units

Sinca floppy discs were first

used for diegnoatic software in IBM's 370 mechinas et the end

of the last decede, these de-

storega aquipment for meny

spplications. Hare John

Moore, managed of Europaan

operations for Neshua Com-

puter Products, looks at the

development of the floppy and

considars soma new areas,

such as word processing,

factor in many systams.

vices have bacoma standard

It is doubtful whether 4,000 had been shipped by mid-1978. However, now that the wear problem has been overcome, the market for double-sided drivas is expected to explode, with orecasts that 250,000 units will oe shipped in 1979.

in addition to greater storoge capacity on the stondard 8-inch discs, there have also been developments to meet the need of

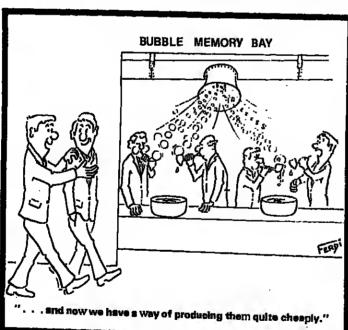


copacity: by doubling the bi density and increasing the track density. A paper presented to ANSI in February 1978 indicates that of least one polyester film manufacturer is ready to announce a dramatic improvement in the thermal and hygroscopic (expansion or shrinkage sccor ding to the amount of moisture) vulues of the substrate it is currently manufacturing.

This could have a significant effect on the flexible disc market, and means that any predictions of the muximum espacity possible per disc could be very inaccurate. In theory there is no limit to capacity.
The original use for the floppy

illse, as a illagnostic and data entry medlum, is no longer an exciting new development. The excliciment now is concerned llies of the Hoppy and its application us a low-cost storage device (us computed to tape cassettes or cartrhiges).

At tomorrow's espacitles, one standard size, double-sided flexible disc will be capable of storing 3,000 pages of typed reports or data, which is equivalent to the capable of the capable combination of a display, keyhourd and flexible disc systam, with high-speed access to data anywhere in the disc file is ohvlously much faster and more. accurate than searching through 3,000 pieces of paper?



Cost and speed

access timas, but will be priced at 25 per cent to 30 per cent of the cost of the equivalent amount of disc storage today.

As I stated earlier, tapa will continue to be a viable storage product. Recently announced improvements lesd us to believe that tape has the potential for significantly improved data densities. Tape is still the most cost-effective storage medium for large sequential files and for direct acceas storaga device direct acceas storaga device backup, and it will remain so for at least the next several years.

This does not mean that some in the several of

These will fill some of tha secondary storage needs mentioned aarlier. Charge-coupled devices, we beliave, will have evolutionary rather than the potential of being three to characterising the data slorage seven timas less costly than industry. The everal deals is seven timas less costly than industry. The everal deals is seven timas less costly than industry. The everal deals is seven timas less costly than industry. The everal deals is seven timas less costly than industry. The everal deals is constructed in STC product development and will be we are challenged to provide used by other companies, greater storage capacity and in the everal deals are considered to the everal deals and the everal deals are considered to the everal deals and the everal deals are considered to the everal deals and the everal deals are considered to the everal deals and the everal deals are considered to the everal deals and the everal deal

MAGNETIC STORAGE MEDIA Amorphaua aemiconductor materiais were cansidered as Such memories heve been under development at Bur-roughs earlier this year could lead to the ovonic memory, as Amorphaua aemiconductor materials were cansidered as nothing more than e acientific curioeity at one time but are now being taken aeriously by the office equipment bualness es the basis for updetable micrafiche, by the energy michigant into the firm that has pianeered the prectical appliance of amorphous continuous materials under the company of amorphous continuous materials under the continuous con industry es e far chesper means af converting sunlight into cation of smorphous semiconductar materiels under the Bluhm, emarphous devices meneger at Burroughe, desectricity than cryatalline metericia, end by the computer direction of its founder Stenfard Ovshinsky. A manufacture scribes have the device is made and gives its performance characteristics.

THE ovonic memory switch was announced by S. R. Ovshinky in 1968, along with a related device, the ovonic threshold switch. The announcement followed, by several years, the invention of the device. This, in turn, was followed by the commercial offering in 1970, by Energy Conversion Devices, of 256-bit arrays of ovonic memory switches constructed on silicon substrates containing isolating diodes.

Since 1970, there has been continual properss in the structure of the structure of

tinuing development work

All write and rewrite opera-

tions are performed electrically.

The transformation of a device

resistance state to the high res-

istance state is achieved by

driving an appropriate train of current pulses through the de-

vice, such as 200 pulses of 25 mA.

with 0.5 mlcrosecond duration

Since the ovonic device res-

ponds similarly to electric cur-rent in either direction, the

memory cell usually incorpo-

with each ovonic memory

switch, to facilitate selection of

the device to be transformed.

be constructed directly over an

appropriate diode made in the

ilicon substrate along with the

Ovonic memory switches are

other devicea in u silicon inte-

made by deposition and pho-

tolithographic patterning tech-

niques similar to those used in

silicon integrated circuits. The

ovonic material is spatter de-

posited after the lower conduc-

tor structure and the interlevel

graphic patterning techniques

are used to remove all the ovonic

material except for areas

covering certsin vias, where

These vias are called "pores

in current practice and their

size determines the axtent of the

ovonic material avoilable to

participate in the memory ac-

tion. An upper layer of conduc-

tor is then deposited and

memory switching.

memory elements are desired.

lielectric are in place and vias have been opened in the inter-level dielectric. Photolitho-

of each pulse.

grated circult.

vice, in its characterisation, in the implementation of compstlife should result from conible metsilic contacts, in proottrsctiveness of the electrical specifications of the device. Since 1975, Burroughs has been from its high resistance state to actively involved in furthering Its low resistance state is the technology through work performed at its Microcircuits achieved by driving a pulse of current of appropriate value, Operation in Rancho Bernardo, such as 6mA, through the device for several milliseconds. The transformation from the low

Early devices were specified as requiring 150 mA of current for dependable writing or rewriting of information into the memory. By 1974, that current requirement had been reduced to 25 mA, opening the way to relatively essy integration into pipolar integrated circuits compiete with on-chip write circuitry. The prospect for significantly lower write current in the future is good, which rates a silicon diode in series, should ease integration even into MOS circuitry.

Similor significant reductions have been achieved in voltage The ovonic memory switch may requirements. Early devices req-

Vernon Bluhm

uired more than 25 volts for writing or rewriting information into the memory. The present requirement is 10 voits. The lower voltage is now compatible with breakdown voltages for diodes and substrate isolation diodes, found on high-speed blpoiar logic circultry. The pro-spect for even lower write voltage in the future is good.

From the very first, the ovonic memory switch has facilitated high speed read-out Information can be extracted as fast os on-chip circultry can distinguish between a tow resistance state, 500-1,000 ohms, and a high res-lstance stata, over 100,000 ohms. Information in the memory is not disturbed by appropriate reading operations.

Long term memory retention of the ovonic memory switches is dependent on temperature. Too much time, at too high temperatura, results in a graduai conversion of those devices in the high resistance state to the iow resistance state. Preilminory research, however, points to th possibility of many years at 85°C to be achievable, and brief sx-cursions to somewhat higher temperatures have little effect. At lower tempsratures mamory retention is still ionger, Studies in the street of the s

retention is still longer.

Studisa in the lata 60s and aarly 70s indicated good radiation tolarance.

Vary early in the development of the matarial and the amount of electric current, it

Vary esrly in the development of ovonic memory switchss, devices with operating life in excess of 10° rewrife operations were observed. Long life remains an attractive feature to this day. There is a trade-off that can be made between long operating life and other device characteristics. Present devices with the other performance features described here, have typical lives in excess of 10° memory switch material, the Vary esrly in tha dsvelopment

gions becomes partially crystsline, and when excitation is removed, the material in that region remains conductive. A memory device in this condition is sald to be "set".

The restoration of the memory device to its high resis-tivity state is called "reset". "Reset" is accomplished by forcing an electric current several

rent density will be high, aince the extent of the previously established conducting region was determined by tha "set" current and is lass than the extent of the

The brief, typically 0.5 microsecond, pulsa of current used for reset brings about intense heating of the materisl in write and rewrite and long life of the conducting region and retimes as great as the previous stores it to a non-crystalline the ovonic memory switch are "set" current through the device state. The rapid loss of hest to very attractive features. The memory atructure is compact.

its dimensions are determined by a minimum pore dimension of material remsining in its noncrystalline, amorphoua, form. The device is restored to its high described hera, and by lithoresistance state. Muitiple raset graphic tolersnees. The ovonic pulsea are found to be more dememory switch is compatible pendable than single pulses and with sillcon integrated circuits are normally used. and can be incorporated on-The non-voiatility, all-electric

Devices based on the ovonic memory awitch appear to have many applications in electronic

HOW CAN A GROWTH-MINDED SOFTWARE COMPANY DOUBLE ITS PROFITS IN ONE MOVE?

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(a) Tax relief on overseas profits until 1990. (b) Training grants up to 100% of cost of making staff at all levels operational as soon as

(c) Rent subsidies on leased properties and non-repayable cash grants.

(d) Cash grants for specific equipment needed

by your operation. 3. Geographical. Ireland is a member of the European Common Market and locating here puts you right into one of the largest world markets for

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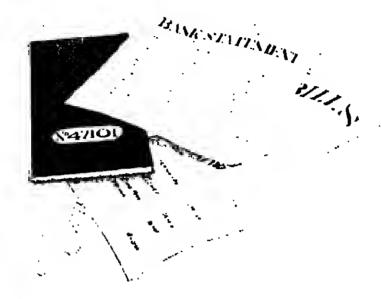
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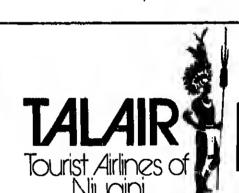
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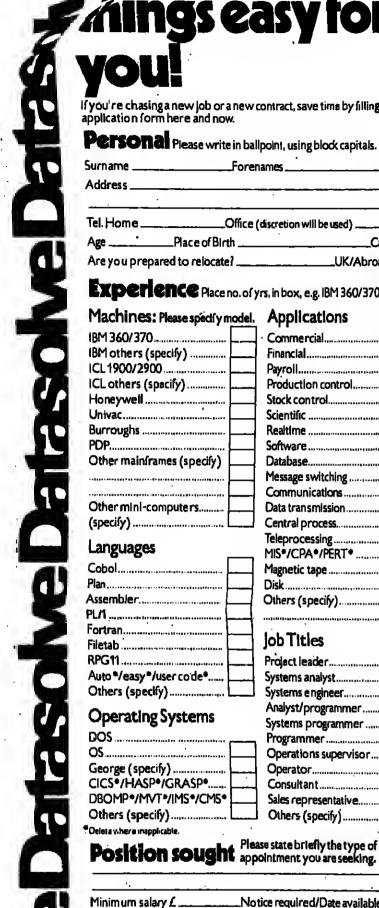
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The installation is operational between 7.30 am to 7 pm by means of two shilts, i.e. 7.30 em to 4 pm and 10.30 am to 7

The Cesniy Serveyer, Gelid Hosse, Cross Street, Prestae, PRI ORG (Prestoe 54793, Ext. 204), to whom they should be reisrsad by the 15th Sop-tembar, 1878. The machine is due to be upgraded to 2004 in lete summer and the Council withes to appoint one experienced RPG1t Programmer wiehling to ge in experience in the Analyst sphere.
The person appointed will have at least eighteen months experience of RPG11, and a deteiled knowledge of ICL 1900 to 2903 Software/Utilities will be regerded as equally import-Pluese quate Baluresco 477.

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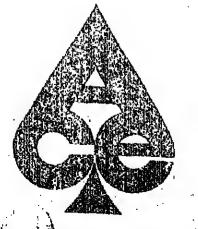
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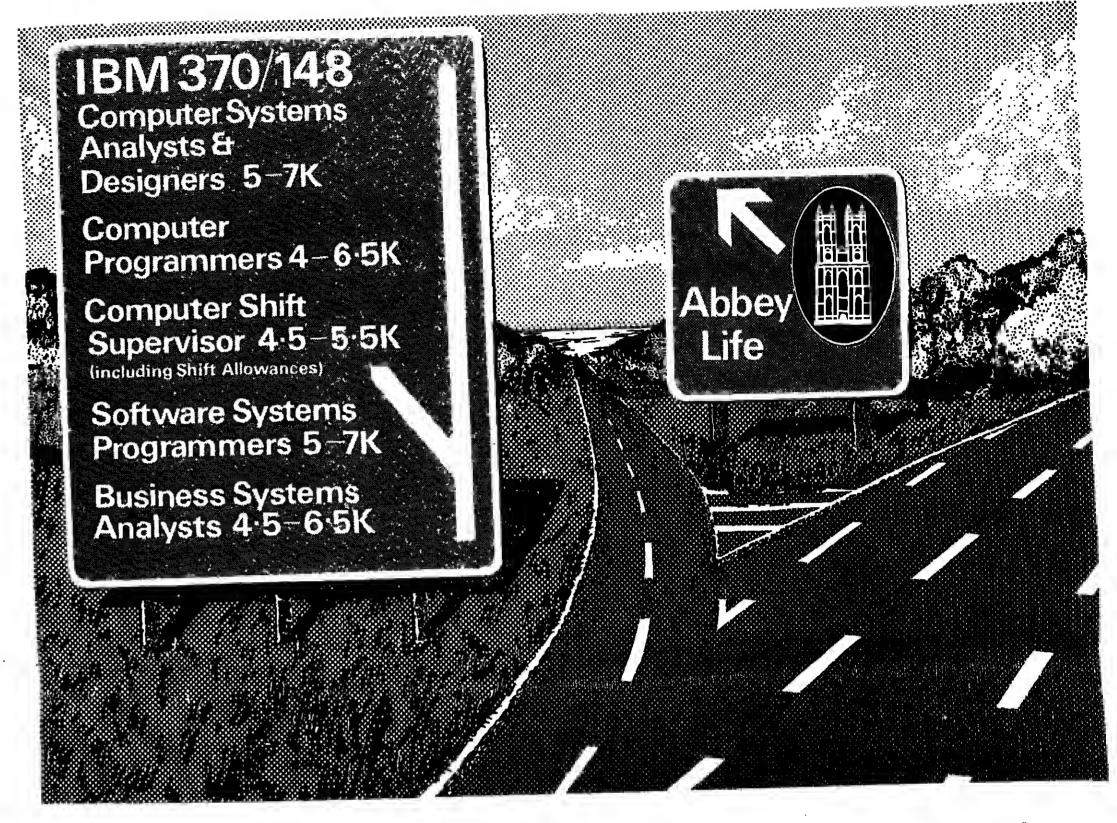
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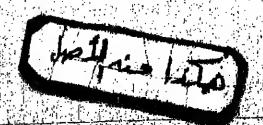
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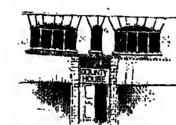
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Interviewing Centre, Suite 203,

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We have recently changed our hardware to a 370/148 running

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need the following people. SYSTEMS ANALYSTS

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Next week Yorkshire will be at home in Leeds. We are Yorkshire Imperial Metals Limited and next THE POOL

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With about a years' D.P. experience to develop systems and programming September we will be in Landon specs and with motentlal We'll be there any time between nuve onto analysis. 10em and 8pm, surjust come in



Applicants should preferably be graduates or have a relevant professional qualification. We can offer salaries of around

C5K-C62-K, many benefits and exceptional prospects within the company, part of a major British Groupe

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YORKSHIRE **IMPERIAL**



Our client, part of a large international organisation based in North Lundon. and the leader in a specialised manufacturing field, is speking to extend its Data Processing services throughout the company.

Recently a real-time order processing system has been implemented on the company's Univid-90/30 mainframe. Due to the success of this major project the Data Processing department has currently many enquiries regarding the computerisation of other commercial applications. Responding in this demand opportunities have arisen for the following career-ennscious

SYSTEMS PROGRAMMER

A minimum two years' Assembler programming and one year's systems software experience. The opportunity exists for the ideal candidate to design and recommend an extensive T.P. network throughout the organisation, where previous experience would be a definite asset.

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Candidates should have a sound ASSEMBLER buckground, ideally supported by a knowledge of COBOL, and be able to liaise with users and produce results with minimal supervision.

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£5000-£5500 A minimum two years' commercial COROL programming background incorporating a high level of self motivatinn gained in a Univar 90 Series of

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Previous experience in installing and maintaining control systems logether with the ability to maintaining control systems logether with the ability to maintaining control systems logether with the ability to maintain and maintaining control systems logether with the ability to maintain and maintaining control systems logether with the ability to maintain and maintaining control systems logether with the ability to maintain and maintaining control systems logether with the ability to maintain and maintaining control systems logether with the ability to maintain and maintaining control systems logether with the ability to maintain and maintaining control systems logether with the ability to maintain and maintain and maintain and maintaining control systems. with the ability to communicate effectively with all levels of staff and

Successful applicants will join an installation that enjuys a very fiexible applicants will join an installation that enjuys a very fiexible applicants. working environment and where many cumpany henefits contribute to make lhis an excellent move in one's career prugression.

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Our existing configuration consists of an ICL 2903 with EDS 60's and simple communications tising 7502 terminals. Exciting enhancements to both Hardware and Software are envisaged, and you will have a real opportunity to consolidate your own experience whilst contributing to our Company's future devalopment.

Ideally, but not essentially you will have an ICL background with RPG2 and/or Cobol coding experience. Previous Involvement with Production Control applications would

We alter an attractive salary package together with the usual benefits. Assistance with relocation will be considered where applicable,

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we are currently looking for a Senior Operator. You will work on a three shift system. The duties are varied and so offer interesting work in a very pleasant environment. We also provide full internal and external training to allow you to develop your technical skills. The successful applicant will have at least 18 months experience on 1/1, 1900

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Application to the state of the Closing date for applications: 25th Coptambe

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Similiens limited is a successful and expanding UK company, part of one of the largest worldwide electroal and electronics originasming organisations. We now have an exciting opportunity for men and women with 18 months' plus experience to develop, lesi and maintain computer programmes in a commercial environment. You will be based at our Simbury Head Office with occasional travel to our branches.

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Working conditions are excellent and, in addition to a negotiable solary, benefits include non-contributory pension schemo, 20 days' holidey antitlement, subsidised restaurant and eports and social club.

Contact Phil Beinbridge, Personnel Department, Siemena Limited, Windmill Roed, Sunbury-on-Thames, Middlesex. Tel: Sunbury 85691 axt 325/322.

Thames Polytechnic

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applications are invited for the past of Computer Operation. Inom persons with at least live OCE "O" lovel passes, or aquivalent. Same knowledge of computer operations would be an advantage but stalling will be given to a suitable person. Commencing select up to C4042 per annum, inclusive.

Ostalis and application form (to be returned by 18th September, 1818) know the Stalling Officer, Themes Polytechnic, Wallington 6 treet, London Bt 8 SPF (01-884 2030 fst. 435).

OF GLASGOW COMPUTING SERVICE

PROGRAMMER piretions are invited from suitable risted persons for the post of Pre-amnes within the Administration

grammas within the Administrative Data Processing Group of the Universary & Computer Service Applications and a Computer Service Applications of the Computer Service Applications of the Computer Service Applications of the Computer Service Service Servic

policetions should be lodgest by 22nd endomber with the Secretary of the leasurity Court (Room 18) The Uni-early of Glasgow Glasgow G12 800 rom where further particulars may be bluined in reply place clarence in 4238P.

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If you are an Analyst or a Programmer and know your business, American Express would like to meet you either in Brighton, London or Croydon

We have told you before that American Express are growing. Computing is e vital part of that growth. Their European Headquarters are in Brighton, where they operate a 370/158 with OS/VSI using CIC/VS and VSAM. The two main programming languages are Assembler and COBOL. They are also currently installing Burrough's B.1800's in Frankfurt and Paris and more installations are planned in other parts of Europe. They also have links to Frankfurt, Paris, Rome, Amsterdam, Brussels, Zurich and Medrid.

They wish to meet a number of Analysts and Programmers who would like to join them in their expansion. As one of the lergest IBM users world-wide, the are very anxious to meet anyone with a strong IBM background. As important is a Surrough's background, both in systems and in programming. The opportunities available internetionally in this second area are significant.

To enable you to meet American Express at a time that is convenient they have arranged to be at the following places at the following times:

CROYDON

Date: 12th Sept. '78 Time: 3.00-8.00pm The Park Lane Suites. The Greyhound Park Lane. Crovdon

(MIMITTER TO WITH V CALLY ... 1. 14 14 14 14

LONDON

Date: 13th Sept. '78 Time: 3.00-8.00pm Royal Westminster Hotel. 49-57 Buckingham Palace

Road, London SW1 BRIGHTON

Date: 14th Sept. '78 Time: 1.00-8.00pm American Express Company Amex House. Edward Street, Brighton.

Incomes are good, there is e comprehensive relocation package, and the career opportunity both in geographic and technical terms is first class. If, however, you cannot attend at the times mentioned, please contact us either by 'phoning John Goldsmith or by filling in the application form

One other point, if you have experience in eny other aree of computing or in management services generally, and would like to work for a dynamic, growing company, then American Express may well heve openings that would be attractive. We would like to meet you as well. Ref. 1893/CW.

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Computer Specialists and Clerical Systems Specialists

Our client is Bell Canada, one of the largest and most successful companies in Canada. They now wish to recruit the following staff for their Corporate Systems Division. In all cases, incomes are extremely attractive and relocation expenses are paid.

Systems Analysts

Applicants should possess extensive experience of project design and implementation on medium or large scale applications. They will need a sound knowledge of I8M hardware/software and knowledge of data base techniques would be

particularly attractive.

There are also openings for SENIOR ANALYSTS with sound experience of on-line system design, based on IBM operating systems. Ref. 1887.

Data Base Software Specialists

The requirement is for personnel capable of optimising the software supporting a large, nultiple user IMS/VS DB/DC system, including BMPs. Knowledge of DB / DC performance and resource consumption analysis packages is

desirable. At least 2 years' experience with IMS (preferably IMS/VS) is essential. In addition, experience with VSAM and /or TCAM, VTAM would be an asset. Ref. 1888.

0 & M Analysts

Candidates should have experience in O & M work across the whole range of business activities, including accounting, production planning and control, purchasing, marketing and inventory control. They should be experienced in work

measurement, used to project management, be capable of presenting and selling proposals, and conducting projects through implementation to user satisfaction. Ref. 1889.

Data Base Design Specialists

Candidates must have strong analytical skills and experience in data base management systems, preferably IMS. A good knowledge of IMS DB/DC, IMS design aids and performance measurement is highly desirable. Ref. 1890.

Hardware Systems Specialists

Candidates should have a minimum of 3 years' experience in a large scale, IBM hardware and software plenning environment. An in-depth knowledge of IBM hardware end plug-compatible peripheral equipment is required, as well as a good understanding of lerge scale operating systems. Ref. 1891.

Data Communication Specialists

'A minimum of 3 yeers' in-depth experience with small scale systems (such as PDP11), used as front-ends to lerge systems, plus e good understanding of communications protocol and

eccess methods, together with a working knowledge of control progrem software is also required, Ref. 1892.

Representatives from Bell Canada will be in the United Kingdom during October. We would therefore like to receive epplications es quickly es possible. Please apply to John Goldsmith, quoting the eppropriate reference number, by either sending a curriculum vitae or esking for en epplication form.



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is a amail and friendly unit having recently upgraded its hardware to an ICL 2904 utilising JCL and plans to in-stell T.P. in the early part of

THE APPOINTMENT requires an Analyst who is competent in all aspects of enalysis as wall as being abla to supervise a small teem and deputisa for the Data Processing Managar in his absanca. This is an excellent opportunity to join the team at an axtramaly interesting stage of devalopment, allowing the salacted candidete to broadan and contribute his or her akills within a rapidly changing environment.

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The successful candidate, mele or lemals, will be educated to a minimum of H.N.C. or aquivalent in a raisvent discipline and will prelarably have a minimum of ans year's practical experience in installation and commissioning and for maintenance of Argus 500 or PDP computer systems.

The position offers a unique opportunity to become involved with mini/micro computer technology as applied to photographic film and paper manufacture.

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Certainly our client offers these attractions, for programmers who are keen to move either towards analysis or to more technical involvement. Working with on-line reol-time applications on an IBM mainfrance will move your career into the mainatreem of commercial data processing.

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Pication Simply to overs the Love pions signs Manager as the design and manager as the design and managers at the tree of equipment with data committee about A lamiliarity with odni / mu to compressions and/or dise commitme obtain equipment of observations and or design but not exceed the Salary THE HIGH IS

HIM Loud programmer's South West London, the years' july experience, the OS Conversion and mine unum of mail order prise unum of mail order prise "O" level from "O" level from anı arlyamloya. Salay to

PROGRAMME

Parsonnel Manager, 18 Ann's Crascent, London SW18.

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This is an imposition new post which requires a person with wide AOP especiance and considerable sibility.

The Computer Development Officer will act as an adviser an camputing mattern to both Houses and will plan and implement all computer developments in Parliament.

It is expected that the Camputer Davelapmen Officer will manage and davelop autable computing earlices but a significant ."In Hause" computer resource is not likely to be required.

computer resource is not likely to be largered.

The work will be closely concerned with the development of oxies new services, including information systems, to satisfy the required Members and Officials of both Houses of Parlament. ful candidate will have had good mar

This is a senior post, in the House of Commons, and the safary will be commonsurate with experience. The salary, however, its likely to be between \$10,000 and \$12,000.

he appointment will commence as soon se possible after 1 at December, 1978 and will be for a period of lour years in the first instance. There is a non-contributory pension achieve with intelligence arrangements with other Public Service pension schemes.

NORTHERN RECRUITMENT **FEATURE**

Advertisers are reminded that the next Computar Weekly area feature will be published on September 28 and will highlight cares opportunities in the North.

Spaca reservations should be made as soon as

Owan Kelly - Manchester - 061-872 421 Eddie Farreli - London - 01-261 8097 Copy Deadling: PM Friday bafore



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- 4. Ideslly you will be single although merried applicants will not be precluded from consideration.

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- 2. You will be working on Batch and Real Time Systems based upon DEC, HONEYWELL and NCR hardwere.

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We are looking for a person who has come up through programming and can damonstrate good systems implamentation with a minimum of five years'

Systems experience should prafars by have been on-line biased and the person should be able to demonstrate their direct involvement with the

This is a rest opportunity and will provide a rewarding and structured carear which will give security and opportunity.

PLEASE TELEPHONE US IMMEDIATELY FOR FURTHER DETAILS OR FORWARD YOUR PREPARED C.V. TO:



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For further details please quota Rel. C.W.197.

South of England

We have a large number of apenings for people with scientific or systems on tronsettantic travel. Candidates should have agreed and veried and some invalve Europeon and towards the section of tronsettantic travel. Candidates should have agreed and or Fortran. The U.K. appointments are placed throughout the south-cest including London and the hame countles and all are with repurable, calcibilished companies. For further details please quota Rel. C.W.197.

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If your experience encompasses Computer Communications - Musseguswitching or Telecommunications throughout their would bise to bear from your the leading consultancy company is now be unduly specialist expenses to assign with the development of some of the most advanced partiest expenses to assign with the development of some of the most advanced partiest expenses though some encomment would be useful. A knowledge of real time languages is also expenses would be useful. A knowledge of real time languages is also expenses Projects can be arranged on collect a contract transmission beautiful and details please quote file. C W 199

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We have a varied selection of openings for Tachnical Authors throughout the south. These appaintments one all with major computer manufacturers and therefore require some previous experience in the production of tochnical openications and ooftware monuels. If you would like further information art any of these appointments please quote Ref. C.W.200.

We are seeking on behalf at ordering Minin/Maintrams Manufacturer, systems programmers to work on the development of besic software. The ideal candidate will have worked for a computer manufacturer or activate and have appellence at developing software products. For lurther details please quote Ref. C.W.201.

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You will ploy a very important trent rate essisting the selected of a large international granisation. Responsibilities and duties will necessitate working on cliont premises percelically, escartaining and compiling technical specifications which will assist the selected to successfully accomplish their tasks. Applicants must possess a good commercial 9.P. background along with a pleasing and halpful attitude.
For turther details please quote Ref. C.W.204. A young and highly successful software consultancy with a ropidly aspending ards: book, is now seeking COSOL programmers with eround two years' expellence to help consultate and dovelop new business in London and the aouth-seat. Projects ceves a wide veriety of applications, mointy in the commarcial socior, and offer planty of scope to creative, carear minded individuals. For further datells please quote Rol. C.W.203.

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From time to time we are ested by a number of U.K. and eversors clients to recruit personnel for short and long term assignments. In, if you are histogeness of the complete your current contract of might great be weath your white to give us along quering Reference I.W 205

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the clients' front door. "Morning Fred. How's tion, but we were far too the wife? Looks like the summer's over. You don't We didn't really listen too want anything today do much because we were

all the time.

ceived plan which is devised call" meent ho didn't went

the selesman's amployer." The sales objectives can

be wide end veried but whether the need to call is brought about by cliant complaint, cold canvasa or whetever, most of these

As the use end number of computers grows so does the need to transport them from manufacture to sustamer, or manufecture to austomer, or from location to location. To meet this need SCI Transport Services of Letoseter, has introduced a vehicle specifically idealgned to carry specialised equipment. Here, Michael Beiten, meneger of SCI, checke the lerge tall lift of the track. The body was built to \$01's specification by Murphy Bros of Leicester.

The importance of pre-I've heard that expression call preparation cannot be so mony times before, particularly from selesmen overemphasised but as I making appointments by have covared this topic before, I won't bore you with Salesman: "i'd like to visit the details.

Okay, I admit there ere times when a speculative Client: "Oh reaily Salesman: "Just a routine Client: "Well, all right, I cilent without a formai suppose so," or alternatively, "I see, well why don't you leeve it until you have some real justification

not very impressed. If he I What ere the benefits to gives the first of the latter my company? 2 What are the disadvanrasponses he is torn be-

cover for a crafty selling handle eny situation which ploy or just a time waster. may erise? In the latter case his respect

Having sald that, there 5 What can be achleved ere always clients sround now that could not be

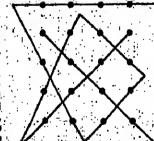
notable exception being Representatives and other business. The "routine cail" such types do, but pro-

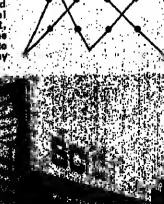
The routine call is an friendly neighbourhood attitude of minil, it is casual, sales man did have a new it has no objective, it is no- best-ever-in-the-world ahoprepared, it is negative and tocopler, at a price-wcit requires no greater effort couldn't-refuse, but we did.

than making the journey to We were busy and his intrying to keep mentally Don't laugh - It happens attuned to the problem we were processing when he Whet is a sales call? As far arrived. We didn't went to as I am concerned it is "the apend money with him onyepplication of a precon- way because "just e routine

to achieve one or more pre- to sell us anything, or so wa determined seles objectives thought. So when he did, we which will result in advsn-felt ha was trying to "rip us cement of profitebla busi- off." And we pulled down ness between the client and the shutters.

TRADER







Futility of just 'a routine call'

bourhood office equipment

call." he ennounced, "and I

know just what to expect."

you next week."

THE SALES BIT

WE had a visit last week thing in common; the from our friendly nelgh- possibility of being converted into an opportunity salesman, "Just a routine for asking for more business, le, trial close or final

call cen be uaeful. The saleaman can often benefit from dropping in to see a appointment. However, the same rule atili epplies. The saleman must spend time reflecting on his reason for calling before he enters the Either way the client is clients' premises.

twean deciding whether tages? "just e routine cell" is a 3 Am I really prepared to

4 What is my real reason for the salesmen must be for calling end whet do I tell the cilent if he asks me?

who appear to have time to achieved easier end better spend en hour or ao discus- at e loter date? In my book, real salesmen sing elmost anything from football to Freud - the only don't make routine calla.

was devised especially for fessional salesmen, never! As it turned out our

> Otherwise, it was quite a reasonable call, I suppose.

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Ascii through the Logic Gate

An epic in 32h words, by Richard Forsyth Block 14 (Blocked Up)

While Simmlo is left to the tender mercles of inspector Extracode, Cleo is alone with Aschi confronting the wild apenou in the hills — Hex, Lambda and Zop heing out cold on the floor of their refuge.

The beast's enormous fur-covered pot-belly filled the-

doorway. Cleo cowered back against tha wall.

"Mi na volae dolorigi vin," It bellowed.

"What'a it saying?" ahe asked Ascii in the hope that a bionic dog might understand a talking ape; but Ascii, who lacked the gift of tongues but understood body lenguage very wall, had interpreted a body of auch size as meening danger and scampered further up the tunnel. The craeture atooped down and poked ita head into the cave. For the first time she got a close-up view of Ita faca. Ita eers ware very tiny and lay flush against the side of its heed. Apart from a slightly protruberant jaw, containing aome vary big teath, and a noae that was more like two holes above tha mouth than a proper nose, its face had a distinctly human aspect. The tuffed red hair that covered its head and chin did not extend across the cheeka or forehead, and its eyes looked too knowing for a mere brute.

Sha could have sworn it was ettempting to amile. Bemused, she shrank further back. She was relleved to see that It was indeed too vast to squeaze insida; but her relief turned to horror when she realised that har three friends were within range of its long arms. She watched aghest as its hand moved out and prodded the 'Off' switch on the

Lambda was the first to react. She yawned and rubbed her eyes as if wakening from a long dream, than pulled out the lead that connected her to the computer. When she opened her eyes and saw the creetura she displayed little

The apeman, who had made no attempt to moleat her, though aha waa within reach, apoke egein: "Ne sentutimon; mi menghes nur vegetalojn."
"How ebout that?" exclaimed Lambda, "e talking apel"

"That's what he said before," said Cleo. "What does it "He says: Have no fear, I am a vegetarian. It's Exper-

anto. I studied it at school." By now Hex and Zap were stirring.

"Wake up boye," sald Lambda enthualasticelly, "we've

Hex end Zep stered at the animal, now squatting on its "It's a Sasquatch!" cried Zep. "I thought they wera

"That's not helf of it." seld Lambda. "It can talk too."
"Vie nmiko mi estas," intonad their visitor aclemnly.

"I thought you said it spoke English," complained Hex.
"Not English," replied Lambda. "Thet's Esperento for 'l' am your friend."
"Well, tell King Kong we want to be his friends too," sald

Hex, appreciating its size and proximity.
"Ni ankaw deziras esti viaj amikoj," said Lembde hesitontly; then she apologised to her friends: "I'm afreid I'm n bit rusty."

but it had understood. It elapped its hunds in marapahension and was soon merrily prattling away to Lambda, happy to have found a fellow Esperantist to confide in. The

others listened in silence. Even Ascii crept closer egain, curiosity getting the better of fear. Whenever it paused to draw breeth Lambde turned to them end relayed the gist of what she had caught, then said a few halting words beck to

carry on their peculiar conversation.
It trenspired that Zap had been right. It was a Seaquatch, or Piedego. But he had also been right in thinking that Sesquatches were extinct. The story that unfolded es Lambde related its utterances was an extraordinary one.

Piltdown, as he called himself, waa a laboretory animal in the strictest eense of that term. Far from being the wild creatura they had taken him for, he was a manufactured artefact. He was one of a number of experimental protoarteract. He was one of a number of experimental proto-typea built by a secret team of epeclalists working in a subterranean cavern deep within the bowele of the Sierra Nueva, unknown to all but a few high-ranking Syatam officials. This team, the Advanced Systems Group, had one ovarriding objectiva - to design the successor not just for mankind (which was elready obsolete) but for the robots and androids men hed created in hie own image, in short,

for the System as a whole.

They learned that Plitdown himself was a sideline, e diversion constructed for entertainment hy one of the more brillient scientiats, but that because of his greet strength he, unlike his fellow inmatea in tho menagerie, had been able to break free during a field trial of hia dietary habita on tha surfaca. As far as Piltdown was aware tha Future System would not dapend on Individuel agents such as robots or androids, still less on home-made Sasquatches. Naverthelese, to perfect the fundamental genetic technology necessary for its production, experiments with fabricated beinga auch aa himself went ahead.

Ha finished by pointing out that he wes sure that a hue and cry hed been raised whan he eacaped and thet e aeerch party might soon follow. Immediately Lambda was assailed by a barrege of questions which the othera wanted to put to him. This quite overwhalmed her mastery of the language and left her dumb for a moment.

While they waited for har to translate, Ascli, ever alert, geve a plaintive whina. His sensitive ears hed detected novement at tha top of the entrance tunnel. He bolted out into the crater once more. Hex realised what was going on. The zookeepers had come to recleim Plitdown.

The zookeepers had come to recleim Piltdown.

"Everybody out!" he shouted, grabbing the precious black box as he ducked out into the open eir. Cieo, Lambda and Zep followed rapidly. Without westing any time, Piltdown, who had jumped to the same conclusion, randown to the dead tree-trunk by the weter. He wrapped his huge erms round it and uprooted it with one mighty headers and it to the cave where he let out a street of the cave where the then, grunting, he dragged it to the cave, where he let out a terrifying roar before plugging their exit once and for all.

They were safe for the moment; but, looking up at the cliffs that enclosed them, Cleo couldn't prevent hereelf, and the terrify "How are we ever on, to get out?"

How indeed? There must be some way out of here.

4 1978, Richard Forsyth, Rair Timesharing.

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